

CANADIAN GEOGRAPHICAL JOURNAL

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"Cootes Paradise", Royal Botanical Gardens, Hamilton, Ontario.

W. V. Cockman

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THE PUEBLO INDIANS OF NEW MEXICO

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Aklavik—A Problem and its Solution

by R. GORDON ROBERTSON

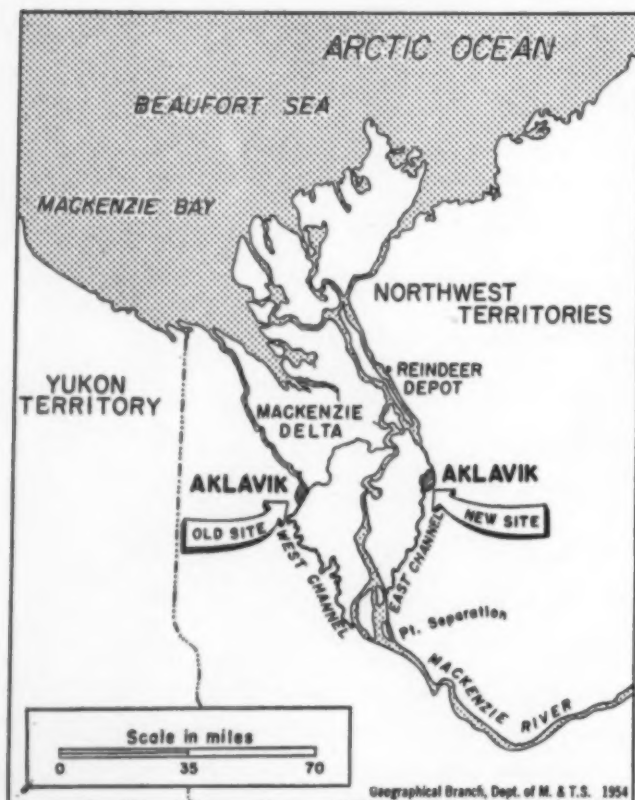
VIRTUALLY ALL CANADIANS at some time or other — and most Canadians most of the time — labour under the illusion that they are a northern people. We are inclined, unconsciously almost, to think of ourselves as having a monopoly of northernness. The fact is that while forty per cent of our country lies north of 60°, we all crowd into the southern edge of it, huddled against the United States, and have hardly poked a shivering toe into the cold waters of the north.

The two most northerly Canadian communities of any size are Whitehorse, in the Yukon Territory, and Yellowknife,* in the Northwest

Territories. Whitehorse has perhaps 4,000 people and is about 61° north. Yellowknife has some 3,000 people and is about 62° north. About half a dozen other countries in the world have a good many communities much farther north, some of them a good deal larger. Alaska has Fairbanks at 65°; Iceland has Reykjavik, its capital, at 64°; Norway has Narvik at 68°; Sweden has Lulea at 66° and Keruna at 68°. European Russia has Murmansk at 69°, with a population of 150,000. In Siberia there are some cities of over fifty thousand population north of 60° and many substantial communities well within the Arctic Circle.

The only Canadian community of any size that can compete in northerliness with the places I have mentioned is Aklavik. It is roughly 68° north. It is not large — only some four hundred of permanent population at the present time — swelling to perhaps fifteen hundred when Eskimos and Indians come in during the summer. There are, of course, many good reasons why Canada has few towns in the far north. However, Aklavik is our one substantial Arctic community, and recent developments there are of interest.

Aklavik is, in a sense, both the end of the line and the centre of operations. It is nearing the end of the long water transportation system via the Athabasca, the Slave and the Mackenzie Rivers that connects the arctic coast of Canada with the populated regions of the south. Because it is the end of that line, Aklavik is bound to be important as developments proceed in the far north. It is and will continue to be the centre of administration for the Eskimo people of the Western Arctic. As coastal transportation grows in the north its importance will grow. A new factor too has now entered the scene with the decision to con-





Aklavik, set in the midst of the maze of water, marsh, and spruce forests that form the Mackenzie Delta.
Northern Affairs photo

struct a Distant Early Warning Line across the extreme north. In short as the Canadian illusion of being a northern people begins to take on some semblance of fact, Aklavik is going to have a steadily growing importance. With this background, it will be appreciated that the decision of the government, taken just over a year ago, to move the entire community of Aklavik to a new location was not lightly taken. This article is about the reasons for the move and the progress that has been made.

Setting

Aklavik lies on a bank of silt jutting into the West Channel of the Mackenzie River. It is in the midst of the Delta formed by deposits laid on the river bottom over the centuries. When you reach Aklavik by air on a summer day, there is an impression of a fantastic jigsaw puzzle of water — hundreds of lakes extending

over the horizon — laced together by dark green patches of spruce forests. Below, the brown waters of the Mackenzie wind down to the sea. Far in the distance is the ocean on the north, and the peaks of the Richardson Mountains form a backdrop in the west.

This is the edge of the tree-line. North and east are the barrens, south and west the bush: spruce, balsam, poplar, some birch, and thickets of alder and willow. The trees are stunted and interspersed by short grass, mosses and native flowers. In many places, there are open patches of meadows unable to support even the willow or alder.

Although the ocean is only sixty miles away, the climate of the Delta is continental, with low winter temperatures and exceptionally warm, short summers. Winter begins in late September and lasts for at least seven months. Only sixty days of the year are free of frost.



The annual precipitation, in terms of water equivalent, is about nine inches. The average annual snowfall is only about half that of Ottawa. Although the winters are long, in general the climate of the Delta is relatively pleasant for a place approximately one hundred miles north of the Arctic Circle.

The brown bear from which the name of the settlement was derived has largely disappeared from the immediate vicinity of the town. Valuable fur-bearing muskrats still live in the river and its banks, burrowing and breeding in the wet, swampy soil.

It was as a fur trading post that Aklavik was first established. In 1912 a Hudson's Bay Company trader set up camp on the Pokiak Channel opposite the present town, close to an Eskimo encampment. It was halfway between Herschel Island and Fort McPherson, a convenient centre for the trappers of the Delta, and it grew in importance. In time the settlement moved across the channel.

Between 1919 and 1926 the real growth of Aklavik began. Anglican and Roman Catholic missions were established as well as a post of the Royal Canadian Mounted Police. The Royal Canadian Corps of Signals established the first army unit at Aklavik — a signals station. Later the Signals helped to establish station CHAK, the first commercial radio station in the Northwest Territories. Thus, in about forty years, Aklavik has grown from a



The Anglican Cathedral at Aklavik is the episcopal seat for the Bishop of the Arctic.

Left:—Some of the buildings of Aklavik, seen across the Pokiak channel.

trading post surrounded by Indian tents to a settlement of permanent houses, commercial enterprises, mission buildings, government offices, and hotels.

Aklavik was built largely on a single resource — the muskrat — and it has been subject to all the hazards arising from a single product. The fur market has always been highly sensitive to the whims of fashion. At best it is uncertain, and the low fur prices of recent years have brought hardship to the trappers. The situation has been further exacerbated in the past five years as the increasing population has resulted in an overcrowding of the productive trapping areas. The average annual fur production in the Aklavik area over the past five years was valued at \$297,000 of which roughly three-quarters came from muskrats. The catch is sold or traded to the various traders in Aklavik by Eskimo, Indian, and white trappers.

Other economic activities in the Delta include reindeer herding, centred on the Federal Government reindeer station on the east side of the Delta, and some hunting and fishing which are of no commercial importance.

The administrative functions of Aklavik are no less important than its economic activities. Between twenty-five and thirty officials from five federal departments represent, with their families, about one-fifth of the total population.

AKLAVIK—A PROBLEM AND ITS SOLUTION

Aklavik is an important educational centre which draws four hundred children from the Delta, from along the Arctic coast as far east as Spence Bay, and from as far south as Fort McPherson. The Anglican and Roman Catholic missions operate churches, hospitals and schools serving not only the local population, but the whole Delta region.

Communities and installations along the west arctic coast can best be supplied by the Mackenzie River route. At present Tuktoyaktuk is the northern terminal point for the Mackenzie system where goods are unloaded and prepared for distribution along the coast of the Beaufort Sea, but a new Aklavik might also serve as a trans-shipment point for materials going on by air.

Aklavik should be a valuable centre for air transportation. At present it is not, for there is no permanent air strip in the whole Delta. For about three months every year, at break-up and freeze-up, no aircraft can enter or leave. This is a situation which must be remedied in any new site.

The Problem

This, then, is the setting: a fur trading post which has become an increasingly important administrative and communications centre in the far northwest. Why should it be moved?

There are many reasons, but the most im-

portant is the nature of the land on which the town now rests. The ground is permanently frozen to a depth of about a thousand feet and the top eighteen inches, known as the active layer, melts and freezes each year. The permafrost extends right to the river bank. The soils are silts with high concentrations of organic materials in low places, and a very high water content; in fact there are about equal amounts of ice and soil.

The permafrost itself need not create serious problems, nor is it impossible to build on silt, but the combination of both is formidable. The first problem is created when the insulating layer of vegetation has to be removed for construction or other purposes. The ice in the soil melts, but there is no way for the free water to run off. There is no significant ground slope, and the permafrost rules out any sub-soil drainage. Water collects in pools and the gradual process of melting continues. The result, between break-up and freeze-up, is mud, extending from the water's edge throughout the whole community. It is more than an inconvenience. The construction of proper roads is impossible; any form of land transportation is difficult and costly.

The action of melting also seriously affects buildings. When a structure is erected the removal of vegetation contributes to the melting

The silt of the river shore at Aklavik. To the west the Richardson Mountains rise above the flat Delta.
World News Services





One of the stern wheelers on the Mackenzie that have served the North so well. Here, with three laden barges, she is moored at one of the settlements up-river, still hundreds of miles south of Aklavik, but with passage of the Slave River and Great Slave Lake behind her. World News Services

of the permafrost; the heating of the building aggravates the problem. The permafrost melts, and inevitably melts unevenly, causing serious heaving and sagging. Many methods have been tried to alleviate the problem — piles sunk deep in the permafrost, buildings set on rigid frames to allow the structure to float, the use of insulation on the surface. They have had varying measures of success. None can totally meet the problem. The only final solution is to move to ground which has better drainage and lower moisture content.

If the fine grained, wet soil creates problems for roads and buildings, it presents even more serious difficulties in the laying of sewer and water mains. Pipes could be laid even at the present Aklavik, but the cost of installation and maintenance, with expensive pumping equipment, would be high, and there would be no guarantee of uninterrupted service.

Lakes and marsh enclose Aklavik in a tight space against the river channel. There is no practicable way for the town to expand, but it must expand to fulfill the role that its position



Indian boats and barges lined up along the eroding river bank near Fort McPherson. In the background is the beginning of the Mackenzie Delta land which extends from here to the sea, about 125 miles away.

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An Indian family leave the bush to spend the summer at a settlement and collect their treaty money. They travel the Mackenzie in a fleet of canoes, powered by an outboard motor attached to one, and bring with them all their goods and chattels, including the dogs.

World News Services

in the developing northwest has given it. There is a danger that if the town does not move either construction will become increasingly costly on even more unsuitable ground, or the present community will split into two relatively poor sites.

The soil and topography also makes an airfield in the vicinity of the present town impossible. Air facilities are needed not only to serve the town itself but to support activities, including defence projects, in which the town may be playing a part.

The other enemy of the present town, besides the soil, is the river. Aklavik is low lying and subject to flood at break-up. In 1936 and again in 1949 there were serious floods. Even when the river is not flooding, it is eroding the highest ground at the present site, and gradually the edge of the town is being eaten away. It would not be many years until some quite substantial buildings would have to be moved or abandoned.

The Solution

It was with these factors in mind that, just



Unloading freight at the Aklavik waterfront. This cargo has travelled by water from railhead in Alberta, 1,800 miles away. Note how the soil of the river bank is being washed out.

World News Services

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It is unusual for Eskimos and Indians to mingle, but it happens in the Mackenzie Delta and this group has gathered to watch square dances introduced by the white residents. The mixture of cultures is evident in the dress: tartans and parkas; printed gingham and furs; moccasins and rubbers. The baby belt (for carrying the infant) across the shoulders of the Indian woman in front row is decorated with design and beads of European origin; it is reflected in the band on the parka skirt of the Eskimo girl (against back wall) which replaces the geometric caribou skin pattern of old. World News Services

over a year ago, the Government reached its decision to move Aklavik. Many new buildings, government and private, were about to be erected in Aklavik and any delay in deciding to move would have been costly. There was then no alternative site — in fact there was only the scantiest information available — which gives a measure of the urgency of the situation when the decision was made.

The problem of the move of Aklavik, on the official level, lay with the Advisory Committee on Northern Development. This Committee, including senior representation from all departments having direct responsibilities in the north, had made the recommendation to the Government on the need for leaving the present site. The immediate problem was finding a new site. This was the task of the Department of Northern Affairs and National Resources as the body designated by statute to co-ordinate federal activities in the north.

The Department of Northern Affairs organized a site-survey team* which was to live and work in Aklavik from March until late

September 1954. Long before it left Ottawa, however, many decisions had to be made. After study in at least a dozen offices, a list of eleven factors by which potential sites were to be judged, was drawn up for the team:—

Essential factors: (a) Suitability of the site from the economic and social point of view; (b) Suitability of the ground for permanent sewer and water systems; foundations and roads; (c) Access to a good river channel; (d) Availability of a suitable site for an airfield; (e) Water supply. *Highly Desirable Factors:* (f) Sewage disposal; (g) Availability of gravel and sand for building; (h) Possibilities of the site as a trans-shipment point from river to sea-going vessels. *Desirable factors:* (i) Availability of wood; (j) Availability of coal; (k) Availability of a hydro-electric power site.

In March 1954 the team set out. Its eight members included five engineers and three specialists in geography and geology. They lived in a camp which was moved from one potential townsite to another by tractor trains, snowmobiles, dog-teams, and, as the season

*Other departments played an important part. The Division of Building Research of the National Research Council provided valuable advice and staff. Mines and Technical Surveys, National Health and Welfare, Public Works, and Transport also gave generous assistance.

AKLAVIK—A PROBLEM AND ITS SOLUTION

progressed, by scows, barges, and light river craft. The first base camp was set up on the Husky Channel. It was to move four times.

Most of the team already knew Aklavik, and for weeks before arrival they had painstakingly studied mosaics of the area prepared from aerial photographs. When the expedition started its field work there were nine possible sites. Five were ruled out early from a preliminary examination of the ground. That left two possible places on the west delta flank and two on the east channel.

If possible, the team hoped to find a suitable site on the west side. Most of the trap lines and the caribou hunt are in that area, and to the west lies Peel Plateau, where some day oil may be developed. The west would give the best possibility of land communication with the south. No site could be chosen, however, unless it passed the five essential tests.

Initially, then, the survey work was concentrated on the west side of the Delta. The Husky site moved into the lead early. It was close to the present town, between Red Mountain in the Richardson Range and the deltaic deposits of the Husky Channel. The average slope was slight. Topography for town planning and airstrip construction was excellent. Willows and alders up to fifteen feet high grew along the water courses. Vegetation was plentiful.

The Husky site looked hopeful — until the first test pits and core borings were made. The soil was silt, ice-laden silt, that had many of the same faulty engineering qualities that lie at the bottom of the troubles of the present town. The Husky Channel was ruled out.

The team examined the West Channel site, the last chance for a townsite on the west side of the river. It, too, looked hopeful. But once again soil tests were the deciding factor. With the elimination of the West Channel site went all hope that the future Aklavik would lie west of the Delta.

On the east side of the Delta, there were two possible choices, East 4 and East 3. As usual, the first surveys were made by helicopter. East 4 was found to have one asset which neither of the other two possessed — a deep lake that lay within a mile of the proposed townsite, with ample water for all the town's needs. But East 4 had handicaps. The ground slope was 3 per cent higher than desirable for an airstrip. The slopes on the hillsides were steep. The soil was not silt but boulder clay with a high percentage of ice. If East 3 were no better, at least East 4 was possible.

East 3 lies on the east bank of the East Channel, 33 miles from the present Aklavik by land, 70 miles by water. It was the first site that passed the soils test to the satisfaction of

An important phase of exploration for a new site was investigation of the soil and permafrost conditions. Sample cores would be taken from drills such as this.

Northern Affairs photo





The helicopter used to support the survey camp and transport scientists reconnoitering for a new site takes off over its gas cache. Taken in April 1954, the backdrop is Red Mountain, in the Richardson Range.

Northern Affairs photo

the engineers. The soils are mainly granular with extensive gravel deposits in the form of terraces and ridges. The porous gravel allows ice within it to thaw and drain without the changes of shape which cause heaving and settling. Though they are frozen, the gravels are stable from the engineering viewpoint and would provide material for road surfacing and aggregates for concrete.

Not in every respect is East 3 the perfect site. We did not expect to find the perfect townsite in the vicinity of the Mackenzie Delta, but it is a substantial improvement on the present site. All buildings can be placed on land above the river's flood level, secure from river bank erosion. Surface configuration is good for the provision of sewer and water distribution lines. A safe and dependable water supply is available from the channel, though a treatment plant will be needed. There is good land for an airstrip and it can be linked to the town by road. There is access to a good river channel, and an excellent wharf site. East 3, then, satisfied the five essential qualifications and all three highly desirable ones.

The team's decision was made in August,

and for the next two months work was concentrated on this site. A detailed topographic survey was completed and a large-scale map of the townsite was prepared for town planning lay-outs. The greatest care was taken to avoid disturbing the vegetation which would provide not only amenities for living, but an important insulating layer over the permafrost.

By October the final report was in the hands of the Advisory Committee on Northern Development. In November the Government accepted the recommendation that Aklavik be moved to the East Channel site.

The Timetable

The move of Aklavik is a five-year project. The first year's program has been completed on schedule. This summer, work begins on the airstrip, roads, wharf, warehouses and camp buildings. Field tests will be carried out for sites on a provisional town plan.

The coming winter will be occupied with town planning and the design of water and sewerage systems. In the summer of 1956 the outlines of the new town will begin to emerge. Streets will be laid out, water and sewerage sys-

AKLAVIK—A PROBLEM AND ITS SOLUTION

tems put in, foundations and basements prepared, and some permanent buildings put up. In the winter of 1956-57 any inside construction work which is possible will be continued. The final construction of permanent buildings and the removal of buildings from the old site will take place in 1957 and 1958.

The work of these five years will provide a unique pilot study of what it takes to build a modern town on the rim of the Arctic. The reports and records, and above all the on-the-job experience, will be invaluable.

But most important of all is the meaning of the move to the citizens of Aklavik. The new townsite will be one and a half times the size of the present one, with lots of room to grow. An area five times that now occupied by Aklavik has already been surveyed.

There will be better health conditions, no longer danger from epidemics which might be caused by contaminated water or improper sewage disposal. The deep black mud of break-up time will disappear. There will be proper roads and a good airfield.

The appearance of the new town will be

totally changed; it will be the product of careful planning. The worst of the old buildings will be left behind. There will be a better hospital than the Far North has ever known. The Anglican and Roman Catholic missions have agreed to a single hospital operated by the Northern Health Service, in place of the two mission hospitals now at the old site. There will be a new federal school to help Aklavik fulfil its responsibility as the educational centre of the Western Arctic. The physical surroundings of the new site will be much pleasanter. The land will be relatively dry. The trees will be carefully preserved.

There will be a new usefulness in Aklavik. It will be able to fulfil its functions as a transportation centre. The airport will connect it with the rest of the country all year round.

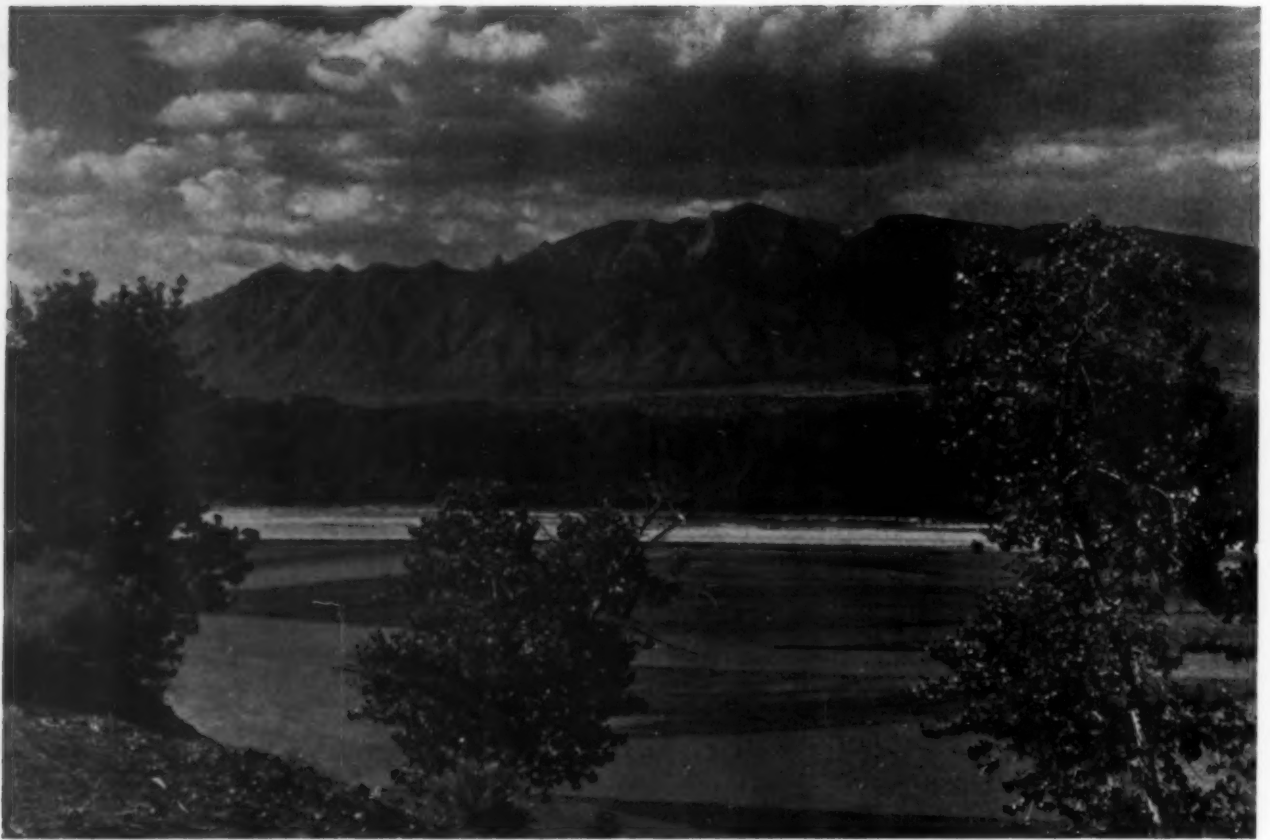
In the four years which lie ahead there is a tremendous amount of work to be done. In terms of the new Aklavik which is to rise, the effort will be well worth while.

And in these four years we shall be developing more than a new town. We shall be developing a new North.

The site for the future Aklavik, in the summer of 1954. On the left (west) is the East Channel. Dock and road will be built at the gravel ridge on which the survey camp is pitched.

Northern Affairs photo





The valley of the Rio Grande near the base of the Sandia mountains, the traditional dwelling place of numerous Pueblo gods.

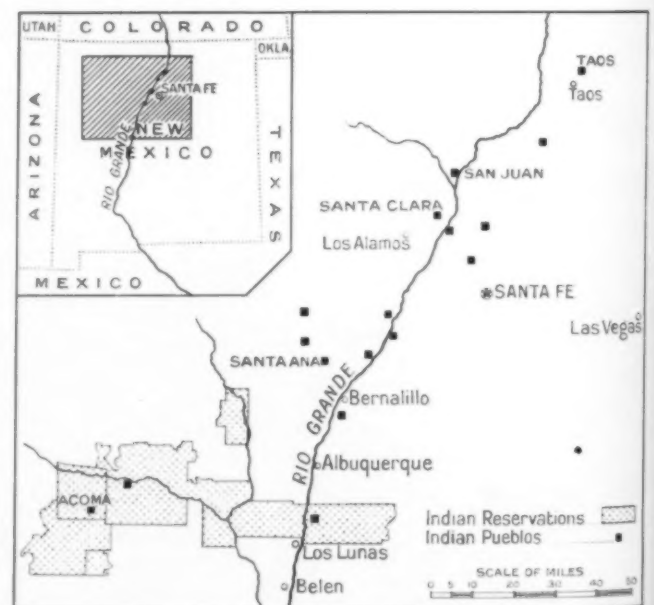
The Pueblo Indians of New Mexico

by CHARLES GALLENKAMP

Photographs by the author except where noted

I SHALL never forget the first time I saw the Rio Grande valley from the air. It was during a flight from Santa Fe, New Mexico south into Sonora in the spring when the river was gorged with melting snow. The valley stretched out below like a thin, green line painted on the sand-coloured earth, and the land on both sides sloped up to scarred plains and steep blue mountains. As far as I could see in every direction the terrain was barren and parched. Only in the valley, where the river could be diverted for irrigation, were there signs of fresh, growing life. For centuries the water of the Rio Grande has been the life blood of growth in New Mexico. Its major cities and rural villages have depended upon it for relief from the otherwise desert conditions;

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C.G.J. map

but most important perhaps has been the river's contribution to the history and preservation of the last frontier of native Indian village life within the boundaries of the United States.

Beginning in the mountainous region near Taos and continuing south some two-hundred miles along the winding course of the Rio Grande, are preserved nineteen villages of the Pueblo Indians—all that remain in the valley of the once vast and powerful Pueblo empire which by A.D. 1000 had achieved a level of cultural advancement exceeded only by the high civilizations of Mexico and Central America. Today, greatly reduced and impoverished of cultural vitality, the inhabitants of these scattered towns continue to defend an ancient heritage in a fierce conflict with new ideas and changing times. The precarious economy upon which their survival has depended is as closely bound to the Rio Grande and its fertile valley as modern man is to machinery.

The earliest historic accounts of the Pueblo Indians were recorded by the Spanish explorer Coronado during his initial expedition to the southwest in 1540. His contact with natives living in curious adobe towns which he called pueblos (Spanish: villages), resulted in the famous legend of the "Seven Cities of Cibola" in which excited *conquistadores* returned from their explorations to tell of pagan tribes living in cities of solid gold. Spurred on by the lure of fortune and the desire to secure the region for the Spanish empire, Coronado began a vigorous attempt to colonize the southwest and convert the Pueblo people to the beliefs and manners of the western world. In recent years, intensive archaeological research has pushed back the horizon of Pueblo* Indian origins roughly two thousand years more, providing a reasonably accurate history of their progression from nomadic hunters to a sedentary, highly adapted people.

Prolific evidence has been uncovered pointing to the beginning of Pueblo cultural development in the wild, remote canyon country of southern Colorado, Utah, northern New Mexico, and Arizona, north of their present towns. Here wandering tribes settled, apparently in great numbers, shortly after the dawn of the

* pueblo refers to village; Pueblo to the Indians.

Acoma's Spanish Catholic mission built during the early part of the 17th century. The entire village of Acoma is situated atop a mesa rising up three-hundred feet from the valley floor. Building materials had to be brought up from below by a series of difficult trails hewn from the native rock.

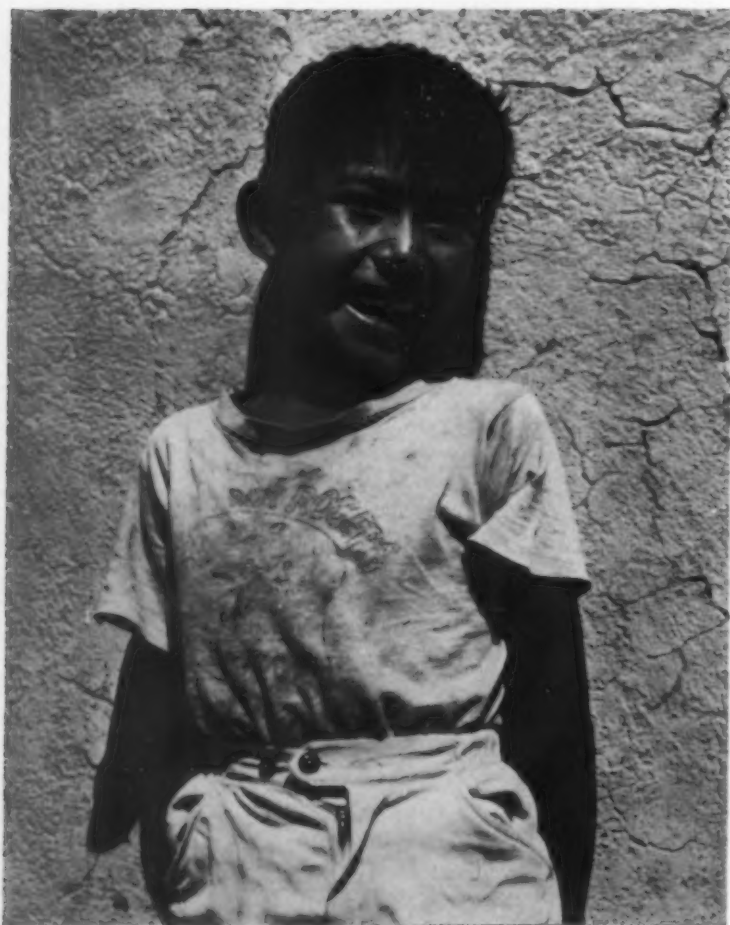


Joseph, a Santa Ana youth who has found it necessary to work during the winter months in nearby Albuquerque, returning to the village for ceremonies and the planting season. Santa Ana has remained decidedly conservative, and the old pueblo, ten miles west of their farming villages and lands, is closed to everyone except by invitation of the tribe.





The pueblo of Taos, northernmost of the presently inhabited towns and the last of the apartment house type of construction commonly employed in ancient times.



Left:—A young Santa Ana boy who tried repeatedly to overcome his shyness before a camera. Most older Pueblos prefer not to be photographed and certain villages forbid cameras, especially during ceremonials.

Of the ruined pueblos in the valley, that of Kuaua is one of the most impressive. It was occupied at the time the murals picturing Pueblo life and religious customs were painted.



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The mission at Taos combines native Pueblo and Spanish architecture in a way distinctly characteristic of the Rio Grande valley.



Right:—Valentino Montoya, former governor and war chief of the pueblo of Santa Ana, symbolizes his people's determination to defend and preserve their native heritage.

of Kuau bank of the river eight miles above Albuquerque is
ed at the with conquest, and one of its kivas contained fantastic
igious come the Spaniards brought about its destruction.





Pueblo children are still carried about in cradle boards until they walk. They take part in adult affairs at an early age, and once a member of a clan they join in dances and secret ceremonies. Marriage is by Catholic and native rites.

Acoma children photographed at the government's Indian School where they will learn to read and write, and speak English and Spanish in addition to their native Keres language.



Christian era, and began the unconscious process of evolving a civilization distinctly their own. They experimented with the relatively new possibilities of agriculture, particularly the growing of maize which had been introduced from the south, probably from the Central American highlands. They quickly learnt to adapt what precious water was to be found in the canyons to the sun scorched land, and invented methods of irrigation still used by the living Pueblos. Rudimentary experiments in architecture such as enclosed cave shelters and subterranean pit houses were climaxed a thousand years later by the construction of gigantic, multi-roomed community dwellings. They discovered the use of vegetable fibres for making baskets and sandals; fashioned excellent, elaborately decorated pottery, and wove cloth from cotton and fur.

But life was severe in the northern canyons. The climate was cruel, its extremes harsh and relentless; and the smaller groups found it necessary to band together to establish huge centres where trade and agriculture could more easily flourish. With this increase of social contact and complete dependency upon natural environment, there emerged vastly complex religious concepts and ceremonial expressions. A profound religious mythology sprang to life and grew through the centuries into a boundless spiritual energy that has contributed more than any single factor to the survival of the Pueblo people.

At the very height of their expansion, a series of disasters swept suddenly down upon their canyon homes, driving them south onto the desert lowlands and eventually into the Rio Grande valley. Drought and pestilence followed by the appearance of war-like Navajo and Apache tribesmen from the north left very little of their former empire intact. By the year 1300, the Pueblos, greatly weakened and widely scattered, had established new villages in northern Arizona and the Rio Grande valley where they suffered further losses during a series of wars with marauding bands of Navajos and Apaches that raged for two centuries before the new threat of Spanish conquest appeared. To the north, in the canyons, the once great cliff cities crumbled away to ruins; the



The Deer Dance as performed at Santa Clara in northern New Mexico. This is one of the oldest supplications to the hunt still extant among the Pueblo people, a ritual designed to pay homage to the spirits of slain deer.

fields grew over with tangled sage; rubble sealed the ancient prayer shrines and ceremonial caves, the walls of which were covered with drawings and symbols depicting the history of a vanished people, until crude etchings of Navajo warriors and helmeted *conquistadores* bearing the Christian cross appeared and the drawings suddenly stopped. The Pueblo empire had fallen, and its descendants began a struggle to preserve what remained of traditions and manners of the past—a struggle which goes on to this day.

The present Pueblo domain may be roughly divided into three areas: the Rio Grande

pueblos, the Hopi villages built high atop three nakedly barren mesas in the northern Arizona desert, and the large town of Zuni in western New Mexico. Although these groups are descended from common ancestors and bear a general cultural similarity, there is wide variance among them in language, religious manifestations, and social organization. The Hopi and Zuni tribes are remotely situated, aloof, and infinitely more difficult to penetrate.

In 1950, I was granted permission by several Rio Grande valley pueblos to embark on a project of filming and recording a series of dance ceremonials. I had hoped to work in that



A koshare, a member of a clan of sacred clowns—descendants of the dead, protectors of the native religion and spirits who can deal with weather, sickness and fertility. The koshare appear during ceremonials, but are supposedly invisible to the other dancers. They mimic, clown, jest, and in this case, imitate the author with his camera.

region as its proximity to the by-ways of modern life has acutely increased the threat of extinction to many native rituals in which I was interested. In the years of living and working among these Indians that followed, I have become strongly aware of their intense effort to retain individuality as a group. Though the degree to which they have given way to modernization varies somewhat in each village, there is a concerted effort by older generation conservatives to keep alive the traditional social and religious framework which results in an active, often violent counterpoint of past and present emerging within their ranks.

Projecting, as I did, my own social era into their background served to define sharply the problems encountered in attempting to continue a way of life fundamentally incompatible with the surrounding civilization. As with any people far removed from our concept of society, it takes time to know them and understand to some extent their reasoning. The Pueblos are no exception. Years of abuse and exploitation have made them cautious, suspicious of intruders; and they have remained remarkably impenetrable despite their increasing integration into modern life. Many of their religious

rites are still carried out in closely guarded secrecy and have never been witnessed by outsiders in spite of prodigious efforts made by anthropologists to explore completely the ethnology of the Pueblo tribes. Once they were convinced my interest was actually more aesthetic than scientific, I had little trouble securing generous co-operation for my work, especially in several of the notably conservative towns. My recording equipment and cameras became the object of much curious attention, and the Indians aided me voluntarily in numerous ways beyond my expectations.

Pueblo economy is based primarily upon agriculture—an exacting kind of agriculture that must extract a maximum harvest from the stubborn, ordinarily effete desert. Skilful mastery of irrigation enables them to grow abundant quantities of beans, melons, squash, chili, and corn. The harvests in each village are distributed among its inhabitants; the excess is stored for the winter months when the ground is frozen beneath thick layers of snow. Most Indian farmers own cattle or sheep, and a swift saddle pony and strong team of plough horses are valuable assets to any Pueblo man's work day. There is an increasing tendency to supplement monetary income by working part or full time in cities, and a number of Indian labourers are employed at the Los Alamos atomic installations which nestle bizarrely in the middle of their ancestral homeland. First consideration, however, is still afforded the responsibilities of village life.

The pueblos themselves are colourful, quaint places—strange to one accustomed to the outside pattern of twentieth century living. Today, as in the past, adobe is the principal building material. It is dug from along the river banks and irrigation ditches, moulded into bricks, and used to construct low, flat-roofed houses laid out in uneven rows resembling mud towns in the North African desert. They are located close to the Rio Grande and often enveloped by giant cottonwood and poplar trees. Bright, painted doorways and windows, strings of red chili peppers, and piles of many coloured corn spice the villages with colour. An unearthly silence shrouds the dusty streets and houses, revealing little of the activity required by the

The Buffalo Dance represents clearly the Indian's desire to personify and imitate nature. Actual buffalo hide and horns are part of the costume, supposedly transforming the dancers into the creatures they represent. Hunting rituals are dance dramas involving the struggle between the hunter and his prey.



inhabitants to survive. These villages sprang up in the midst of desolation and have been continuously occupied since Coronado first saw the desert sun reflecting on the yellow adobe walls, believing them to be made of gold. Nature alone was the material of survival. Every natural resource had to be ingeniously adapted to effect even the most rudimentary existence.

In a society which long ago endorsed the doctrine of privacy and selectivity, communal village life has all but ceased to exist in our part of the globe. The Pueblos have preserved it to a remarkable degree. Feasts, weddings, and fiestas handed down from the Spanish usually involve the entire village. Spring planting, harvests, and hunting assume similar proportions; but at no time is the spirit of co-operation more in evidence than during the numerous religious rituals which comprise a kind of ceremonial calendar of events in each town. A Pueblo man, who served as my guide and interpreter, was once required to devote nine days and nights to preparations for a rain ceremony. His daily tasks, which would necessarily have been neglected, were taken over efficiently and without hesitation by other tribesmen. So it is with all duties related to the general well-being of the village.

Religion is the dominant concern among

these people. Centuries of dependency upon natural environment have made them acutely aware of the multiple life processes of their universe. The many facets of nature—wind, rain, mountains, and animals—are all personified as supernatural spirits, delegated spiritual powers, and drawn into the inner realm of conscious human experience. They have never ceased to wonder at the mysteries of life itself; its veneration has been the prime motive of their civilization.

The symbolic keeping place of Pueblo religion is in the *kiva*, an underground structure entered by a ladder leading from the roof down into the interior. The *kiva* functions much like a church, though its purpose is broader than our conception of the term. It represents the Pueblo universe—the place of creation; and is built to approximate the four worlds of fire, air, water, and earth through which the ancients were believed to have travelled to reach the earth's surface. Every village has two or more *kivas*, closely guarded and secret, where the clans gather to perform sacred rituals, young people are instructed in tribal lore, and the precious images of powerful spirits, *kachinas*, are protected from outside eyes. Here, too, the *koshare* or sacred clowns perform their mystic rites as descendants of the dead, and the Indian seeks return to his old, fiercely



An elderly Santa Ana couple busy sorting a bountiful harvest of corn. Well did they remember the days of stage-coaches, Indian wars, and Federal troops, though the Pueblos were never warlike by nature.

Frank C. Stuart photo



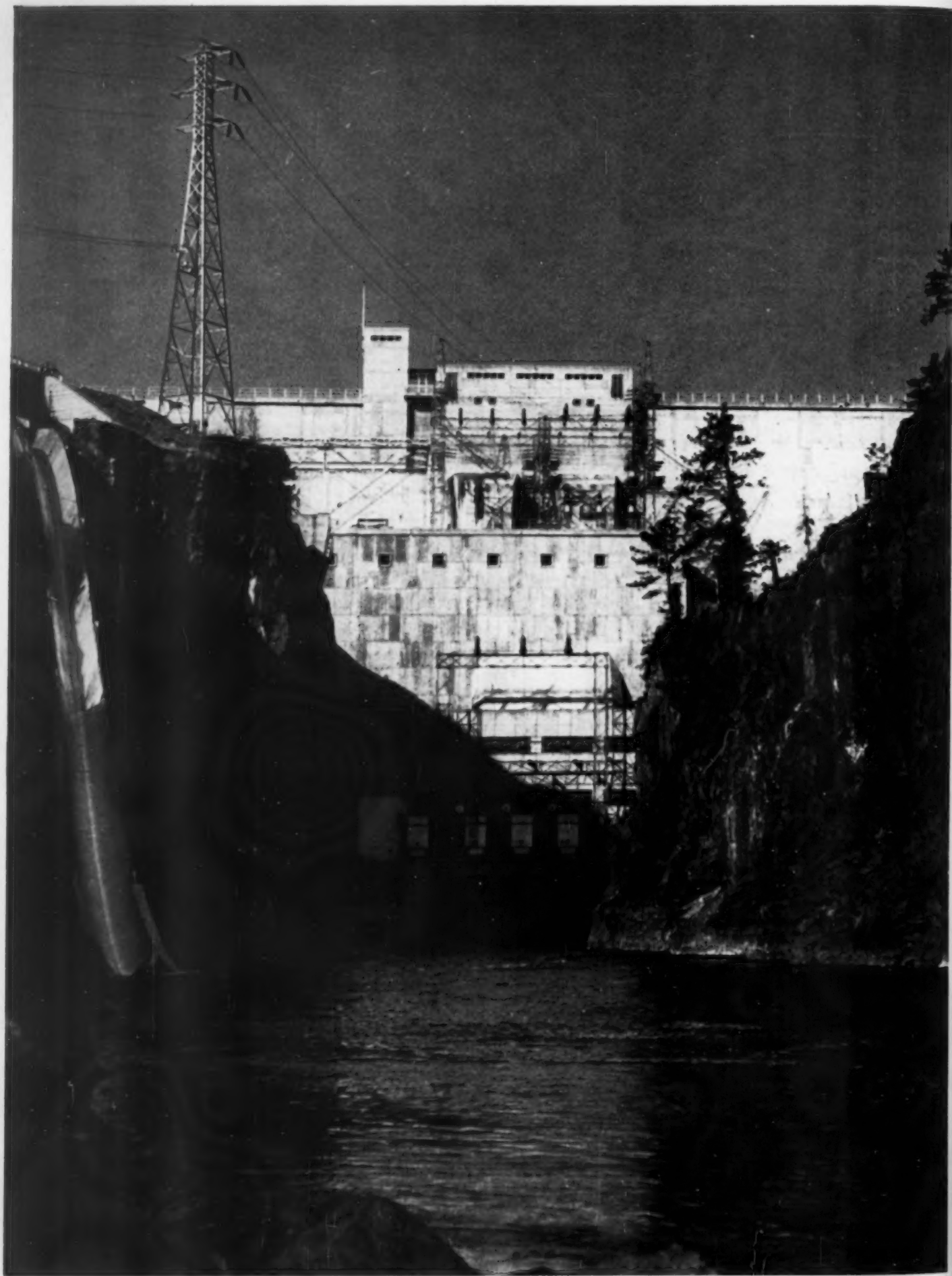
San Juan's Turtle Dance, a passionate, colourful prayer for rain. At the end of the ceremony, the ever-green boughs, a symbol of never-ending life, will be thrown into the Rio Grande and carried symbolically back to the land.

religious self in ways far removed from the civilization in which he must now live. He has, however, accepted the teaching of the Christianity which established its missions in the pueblos at the time of Spanish conquest, and the two faiths are practised side by side. But it is still the ancient gods the Pueblo Indian calls upon when he plants crops or hunts or needs rain for his fields and the intensity with which he values his religious heritage is vividly manifest in passionate ceremonial dances performed to honour the gods. Some, notably the Corn, Deer, and Buffalo dances, are well known; others, the secret masked dances and night chants may very well remain unseen so long as there is a vestige of the conservative spirit alive in the villages.

The Pueblo people face the future with uncertainty. Their civilization has been en-

croached upon to a point that would have annihilated a less vigorous culture. The toll upon some towns has been sufficient to cause open breaks between progressive and conservative elements, though the powerful core of native determination devoted to the preservation of the ancient way of life has so far prevailed.

Theirs is a heritage by its nature noble and peace loving. As individuals they are quiet and subtle; silence is a precious social grace, masking their keen powers of perception. I have spent countless winter evenings sitting before their fires, drinking coffee, and observing the unwritten rule of saying nothing unless it was worth saying. Never did their simple dignity and charm betray their unspoken belief that some day white men will force themselves back to the river and the land and the values of simplicity.



George W. Rayner Generating Station on the Mississagi River has the highest dam built by the Commission.

Ontario Hydro—

A Pattern for Progress

by RICHARD L. HEARN

WHEN that great Canadian statesman, Sir Wilfrid Laurier, looked to the future more than fifty years ago and prophesied that the twentieth century "belonged to Canada", there must have been a spirit of urgency and vision abroad in the land. For it was at this same time that other practical visionaries were beginning their planning in Ontario for the establishment of a power supply and delivery system that would assure that the benefits to be derived from water power resources would go to the people of the province on an economical and widespread basis. Theirs was the vision to realize that in the twentieth century the key to industrial advancement would lie in the availability of low-cost energy.

This pioneering foresight, combined with geographical position and adequate natural resources, permitted Ontario to become one of the heavily industrialized and prosperous areas on the Continent. While accounting for nearly 50 per cent of all manufacturing in Canada, the province's economic picture is well balanced by its extensive and growing agricultural and mining production, in 1954 totalling over \$1 billion and nearly \$500 million, respectively.

The economic history of Ontario over the past fifty years is inextricably interwoven with the progressive pattern formed by the power transmission lines of The Hydro-Electric Power Commission of Ontario (popularly known as "Ontario Hydro"), which now extend into almost every section of the province. As "trade followed the flag", so industrial development and population congregated along the power lines. While an attempt to single out any one factor as the actual cause of the recent spectacular economic development in Ontario might be branded as over-simplification, the fact remains that electrical power and the prosperity of the southern portion of the province, in particular, are inseparable in modern economic terms.

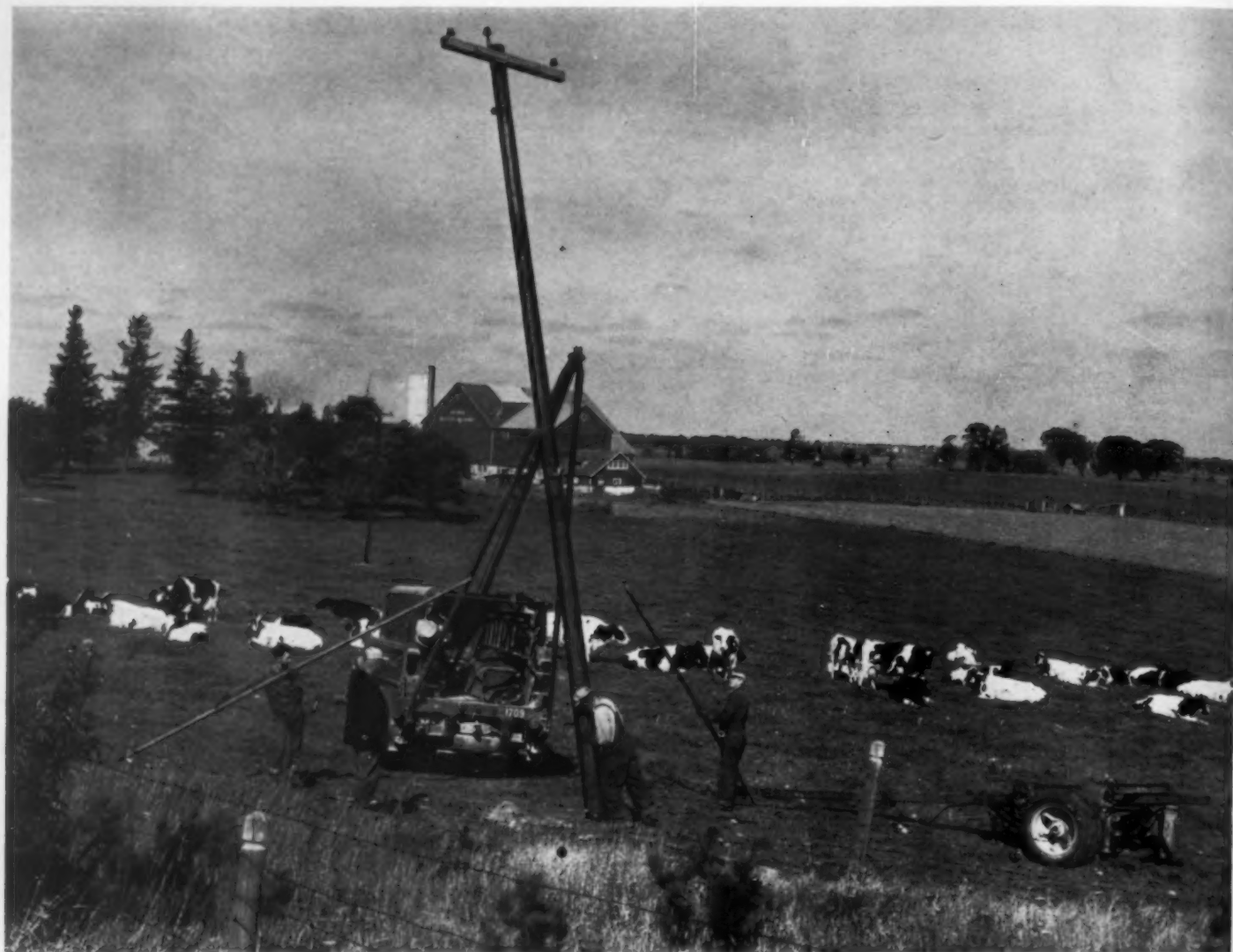
By the very uniqueness of its geographical position, Ontario's eventual greatness was per-

haps preordained. Jutting deeply into heavily populated and highly industrialized areas of the United States and stretching more than a thousand miles northward to Hudson Bay, the province embraces more than 412,000 square miles—as compared with the 267,339 square miles of Texas and 158,693 square miles of California. Within this vast area, is a system of water power streams that makes up for the deficiency in such native energy sources as coal and oil. From the termination of the prairie land of Manitoba eastward through Ontario and Quebec, for a distance of 1,200 miles, the Canadian Shield covers the two provinces except for the plains southwest of Hudson Bay and the St. Lawrence Lowlands. This backbone of mountains is the father of Ontario's greatest natural resource: water power.

To tap this great resource required something more than muscle and the determination of pioneers. It required leadership of a high order which was ably supplied by a group in which Adam Beck, E. W. B. Snider and D. B. Detweiler were among the leading figures.

Snider was a cautious, practical businessman, who had studied hydro-electric power development in Switzerland and was prophet enough to visualize what similar developments in Canada would mean to this great, sprawling country. Detweiler, a manufacturer, was an idealist, a man who dreamed great dreams and had the ability to communicate them enthusiastically to others. Beck, whose devotion to the task of producing low-cost electricity was to earn him knighthood and bring him fame as the "Father of Hydro", came upon the scene at a historic meeting held on 17 February 1903 at Berlin (now Kitchener), Ontario. This meeting included 67 citizens from 17 Ontario municipalities, boards of trade, and manufacturers' associations. It had been called to hear a report of a committee which had been appointed to investigate a co-operative plan for the purchase of electric power.

Adam Beck was Mayor of London, Ontario,



A Hydro crew install new electrical facilities on an Ontario farm. Almost nine-tenths of the province's farms have electricity today, and more than four hundred electrical appliances may be used on farms.

and member for London in the Ontario Legislature at the time. He had come to the meeting, he said, "to learn". What he learned about the meeting's hopes and plans so fired his imagination that he seconded a resolution drawn up by municipalities interested in the Hydro movement, urging the provincial Government to take action on the matter.

The Hydro spearhead formed by Beck, Detweiler and Snider was not to be denied. The Ontario Government took action, and The Hydro-Electric Power Commission of Ontario came into being on 14 May 1906 with Adam Beck as its first Chairman. The Commission was entrusted with the task of developing the water resources of the province in the interest of the people, to provide them with the best possible electrical service at the lowest cost consistent with sound economy.

Ontario Hydro is basically, and in terms of operation, a co-operative enterprise. It is not a department of government, nor are its employees civil servants. The Ontario Government appoints the members of the Commission but it is a separate entity, a self-sustaining organization endowed by legislation with powers to produce, buy and deliver electric power throughout the province and to perform certain regulatory functions with respect to the municipal electrical systems that it serves. The municipalities purchase their power requirements from the Commission and, in turn, distribute it to their customers, under conditions approved by the provincial Commission. Participating municipalities own and operate their distributing systems through their local utilities Commissions. In a very few cases, Ontario Hydro owns the distribution facilities and con-

ducts retail distribution in a municipality. The relationship between the municipalities and Ontario Hydro is close, and any municipality can become a member of the Hydro enterprise following approval by voters at the polls.

In addition to supplying power to municipalities, Hydro supplies power directly to rural customers, including farms, and to certain big industrial users. In the overall sense, Hydro's activities can be described with reference to two systems: the Southern Ontario System and the Northern Ontario Properties, with the dividing line between the two extending roughly from Mattawa, on the Upper Ottawa River, westward to Georgian Bay. The Southern Ontario System, which serves the older and more populous part of the province—roughly 30 per cent of Canada's total population—lies south of this line.

To the north lies the Northern Ontario Properties, an area encompassing much of Ontario's great mineral wealth. The Northern Ontario Properties, which are held and operated in trust by Hydro for the Government of Ontario, serve seven municipalities under co-operative agreements similar to those existing

within the Southern Ontario System, as well as certain large industrial users and retail customers in rural municipalities.

In the early 1900s, an electrically lighted home in Ontario was almost as much a rarity as an automobile. The gas jet was in general use in the city, and, in the country, the oil lamp. Steam power was used in most factories, and men worked amid a clutter of machinery driven by revolving pulleys and belts. On the farm, electricity was relatively unknown, and the chores of the evening and the winter morning were performed in the feeble glimmer of lantern light.

With the exception of some small hydro-electric power developments, most of the towns and cities were supplied with power from local steam plants. The output was small, the use limited, and the cost high. To men such as Beck and Detweiler, it was obvious that what was needed was a planned and systematic development of the abundant water power to increase the output of electricity, reduce its cost and bring it into more general use.

The transition of Ontario from a predominantly agricultural region to one of the world's leading industrial areas began at about the

Some of the preliminary steps in harnessing a river to drive turbines may be seen here at the site of the new Manitou Falls Generating Station. It is on the English River in Northwestern Ontario.







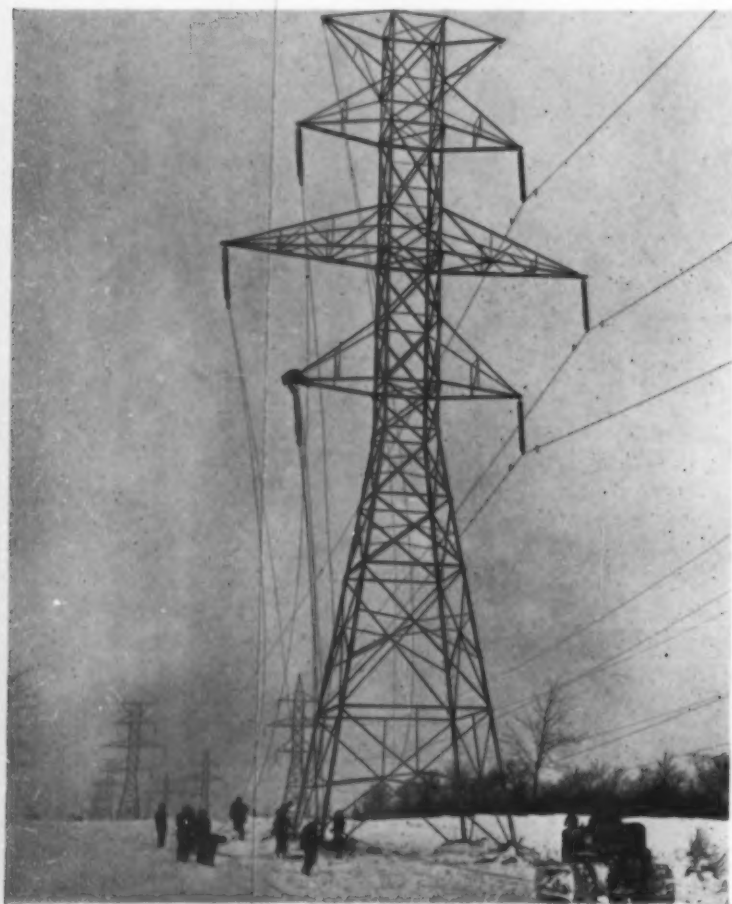
time of the creation of Ontario Hydro. To trace this development over the past fifty years is closely equivalent to following the forward march of Hydro as the Commission tapped the sources of water power, added to its network of transmission lines and supplied an increasing flow of electricity to an ever-growing number of customers. Statistics can at times be sharply illustrative; and as we follow the development of this great enterprise, figures will show the relationship of Hydro to the general economy of Ontario—a relationship demonstrating that Hydro played a most important role in projecting the province into a position of leadership in the economic life of Canada, and projecting Canada, in turn, into the vanguard among the industrial, agricultural and trading nations of the world.

In 1910, the year Hydro served its first municipality (Kitchener, Ontario) with power, the record shows that it was supplying primary power requirements totalling 5,400 horsepower over 649 circuit miles of transmission lines. That year the gross value of agricultural and manufactured goods in Ontario was \$875,000,000. In 1920, the primary power requirements totalled 476,300 horsepower, supplied over 3,331 circuit miles of transmission lines;

and the gross value of agricultural and manufactured goods totalled \$2,500,000,000. Even at this comparatively early stage, availability of power was assuming an obvious relationship to volume of production.

The impact of the First World War influenced development in the years immediately preceding the 1920s. The urgent need for electric power to produce the materials of war, combined with the fact that Ontario had little in the way of coal and petroleum supplies, placed in sharp focus the influence of Hydro on the progress of the province. The call-to-arms in 1914 was quickly followed by demands for more power, and a development program was initiated that was to continue intermittently into the 1950s. In 1913, work began on the Wasdells Falls Generating Station on the Severn River. Others rapidly followed as more and more swift-flowing waters were harnessed to supply the required energy. Generating stations began to dot Ontario's waterways and transmission lines spread in widening circles across the countryside, taking electricity into the mills to supply the sinews of war, and into the shops, the homes, and the farms to enhance the promise of peace.

The economic ramifications of hydro-electric development in Ontario can be perhaps most clearly seen in the Niagara Peninsula where the generation of electric power and the growth of the area ideally complement each other. The great power potential of the Canadian side of the Niagara River has been under development since 1893 when the first diversion of the river's water for power purposes was made. It was from Niagara that power was first transmitted to those communities participating in the Hydro movement, and, in 1917, the river was the site of Hydro's first major hydro-electric project, the Sir Adam Beck-Niagara Generating Station No. 1 (originally known as the Queenston-Chippawa Development). With an installed capacity of 525,000 horsepower, it was at one time the largest power plant of its kind in the world. In the Niagara area, low cost electric power has attracted important industries since early days: steel and abrasives factories, and chemical and metal refineries, which require tremendous amounts of electrical



Lines for high voltage transmission from Des Joachims Generating Station are strung to 200-foot towers near the Ottawa River.



Largest Hydro generating station on the Ottawa River is the Des Joachims which has eight units and 509,000 horsepower. Behind the powerhouse is the massive main dam 2,400 feet long and 180 feet high. Each of the eight steel penstocks encased in concrete has an inside diameter of twenty-two feet.

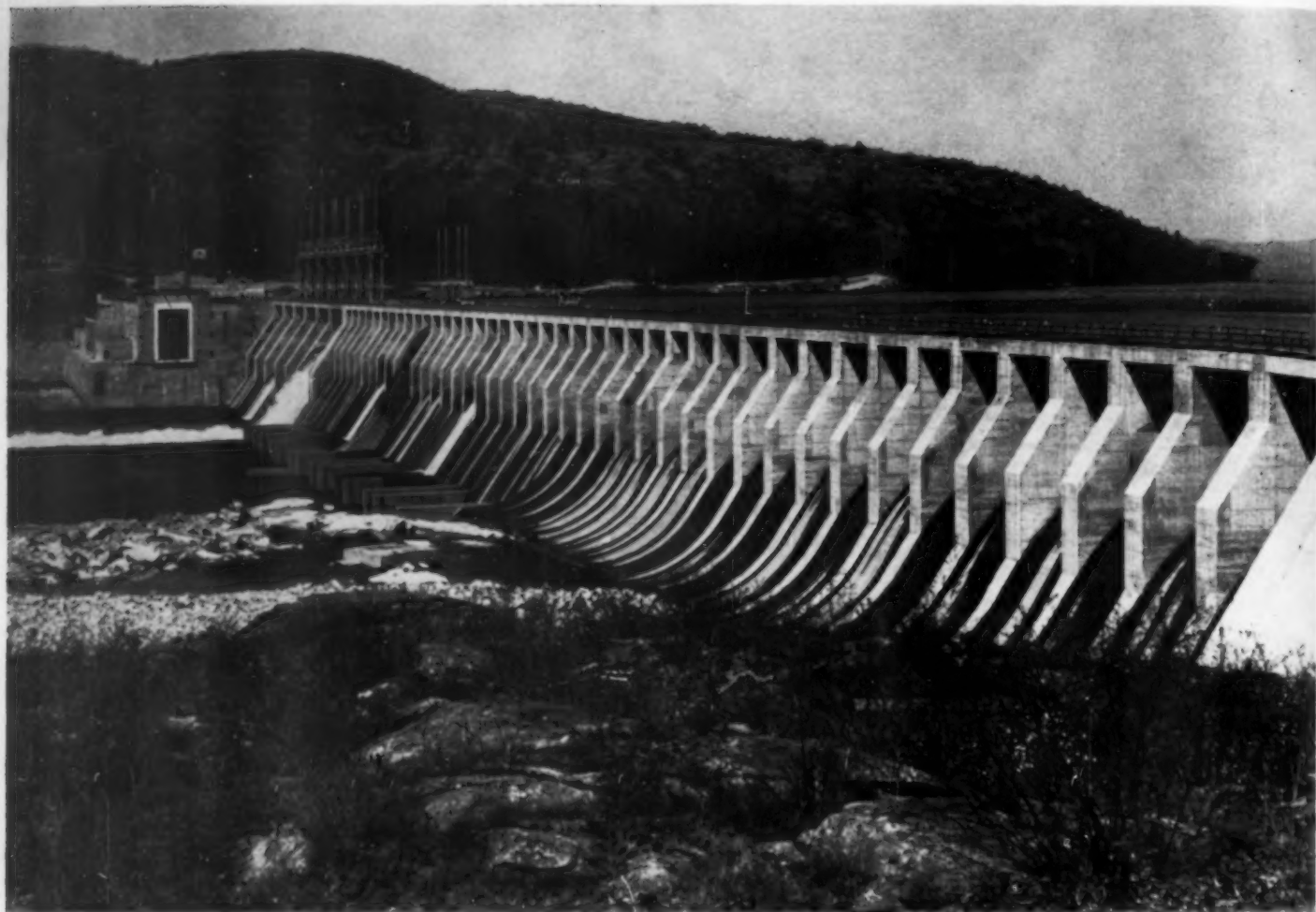
energy. These and many other industries have contributed to making the per capita gross value of manufactured products in the region one of the highest in Ontario. In 1954, for example, 27 industrial customers in the region used a total of nearly $2\frac{1}{2}$ billion kilowatt-hours—almost enough energy to meet the power requirements of the city of Toronto that year.

The broad sweep of the Commission's operations and the romance and struggle involved in the opening of new frontiers as power lines marched across the land are readily apparent in the general development of the mineral-rich Ontario northland. While Hydro engineers were bringing to completion the first of the great Niagara projects, others were busily engaged harnessing the turbulent waters of the Nipigon River to provide the power for the industrial development of the northwestern part of the Province. By 1926 the Cameron Falls development on the Nipigon, with a dependable peak capacity of 75,000 horsepower, was supplying

the bulk of the power to the important twin lakehead cities of Port Arthur and Fort William. Subsequent developments along the Nipigon—the Alexander Generating Station, a mile and a half downstream from Cameron Falls, and the big Pine Portage development—have brought the dependable peak capacity from this river alone to 308,000 horsepower.

Even the great depression of the thirties failed to sap the vitality of this great enterprise. By 1940, primary power requirements totalling 1,864,500 horsepower were being supplied over 9,092 circuit miles of transmission lines, and the total gross value of Ontario's agricultural and manufactured products had increased by more than \$600,000,000 over the 1930 figure of \$2,081,168,362.

Thus far, the emphasis on Hydro's contribution to the economic expansion of Ontario has been on the industrial side. But there is another, and equally important side: rural electrification. And the fact that agricultural produc-



The Otto Holden Generating Station is the third to be placed in operation on the Ottawa River since 1945. It is about 160 miles northwest of the capital and its powerhouse straddles the Ontario-Quebec border. It is one of the sixteen new power sources included in Hydro's vast expansion program.

tion has climbed steadily since electricity and the gasoline engine were introduced—and this, in spite of a declining farm population—is evidence that electricity also occupies a most important place in this most essential field. Consider the fact that electric power can be put to some 400 uses on the farm and you have some idea of why the farmer can produce so much more than he did twenty-five years ago, and with a smaller number of hired hands.

Looking back, it is difficult to realize that farmers actually had to be “sold” on the idea of using electricity. But “sold” on it, they had to be; and thus it was that Sir Adam Beck, Hydro’s first Chairman, became a familiar sight on the rural byways of Ontario with his “Circus”, as it was called. The “Circus” was a travelling demonstration of electrified farm equipment; and with it, Sir Adam barnstormed much in the manner of the early medicine man shows, bent on convincing all who would look and listen of the benefits of electricity.

Rural electrification in Ontario took an important step forward in 1921 when the Rural Hydro-Electric Distribution Act was passed by the provincial Government. Under this Act, the province agreed to pay 50 per cent of the initial capital cost of constructing lines and equipment for the supply of power. Implementation of the Act was a significant factor in providing the highest standard of living at the lowest possible cost for those in the rural areas of Ontario.

During the 1920s and 1930s rural expansion continued but construction was curtailed during World War II because of a shortage of materials, particularly metals. At the same time, farmers in the northern and eastern parts of the province, where rural construction had not been so extensive as in the southwest, began to clamour for service as a relief from the shortage of farm labour.

Farmers had come to realize that electricity was their most valuable “hired hand”—the

ONTARIO HYDRO — A PATTERN FOR PROGRESS

answer to the farm labour problem. Coupled with this was the realization, and the appreciation, of the fact that a few cents worth of electricity would do the mechanical work equivalent to an average hired man's work in an eight-hour day. Electricity was no longer looked upon as a luxury, but was recognized as a necessity to modern-day farming. With this recognition, and with the establishment of a uniform rate structure throughout Ontario, a new era opened in agricultural development.

With the outbreak of World War II in 1939, plans for extending service in both the rural and urban areas were replaced by the more imperative demands of defence. Wartime restrictions on men and materials prevented any large-scale power development. Only essential projects were undertaken. At the beginning of the war, the Commission was operating 46 generating stations, constructed or acquired during twenty-six years of power development activities. With the output of these plants, coupled with some purchased power, the Commission had a total dependable peak capacity

of 2,089,142 horsepower. With restrictions imposed upon non-essential uses of electricity, Hydro through the war years succeeded in meeting the power requirements of munitions plants and other vital industries.

Victory and the end of the war did not, as many thought they would, bring a respite in the demands for electricity. Instead, Ontario was on the threshold of an economic expansion that was to have no equal in postwar Canada. Between 1946 and 1954, sixty-five per cent of the new industries coming to Canada were established in Ontario. Looking to the future, Ontario Hydro—just eight days after the end of the fighting—launched an expansion program that was to overshadow by a wide margin all its previous activities. For the next ten years, Hydro engineers raced to keep up with an unprecedented demand for power. By the end of 1954, fourteen of sixteen new power sources had been brought into operation; thousands of additional miles of transmission lines had been installed, along with the necessary transformation apparatus; the Commission's total assets

Electricity, servant of city and industry, furnishes power for the Algoma Steel plant of Sault Ste. Marie.
Photographic Survey Corporation



amounted to \$1,653,063,771; and total dependable peak capacity had risen to 5,543,000 horsepower—an increase of 113 per cent over 1945.

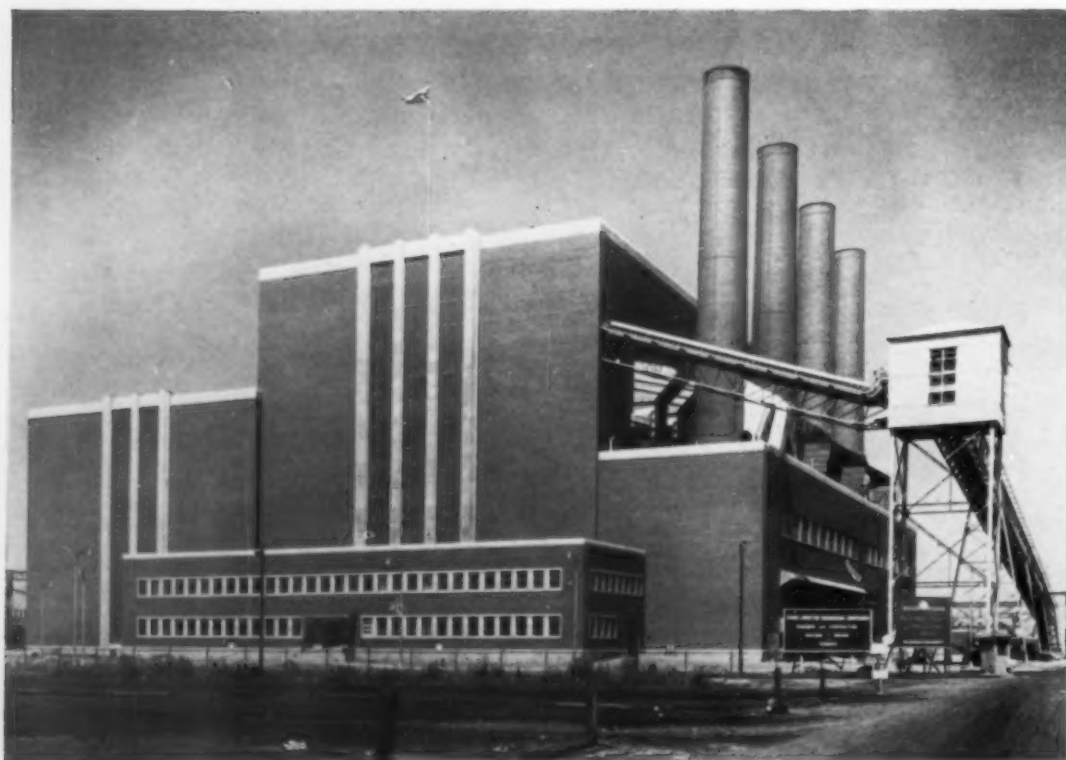
What this meant in terms of planning, administration, and on-the-job construction almost staggers the imagination. It required the pooled ingenuity of Hydro's best engineering brains; the construction of models for advance study on various projects; the hiring of many thousands of construction workers, involving negotiations with many different labour unions and the setting up of an organization for the housing and care of these armies of workers; and, above all, it required the services of a dynamic leader. Such leadership was provided by the late Chairman, Robert H. Saunders, who took office in March 1948.

The arrival of Mr. Saunders on the scene marked the beginning of another era in Hydro history. Big things were in the offing, including such undertakings as a frequency standardization program, affecting some 989,569 Hydro customers, to provide a uniform frequency throughout Southern Ontario that would conform to the prevailing frequency in North America; another big project at Niagara Falls—the Sir Adam Beck-Niagara Generating Station No. 2, with an ultimate installed capacity of 1,828,000 horsepower; and the Canadian half of the 2,200,000-horsepower St. Lawrence Power Project.

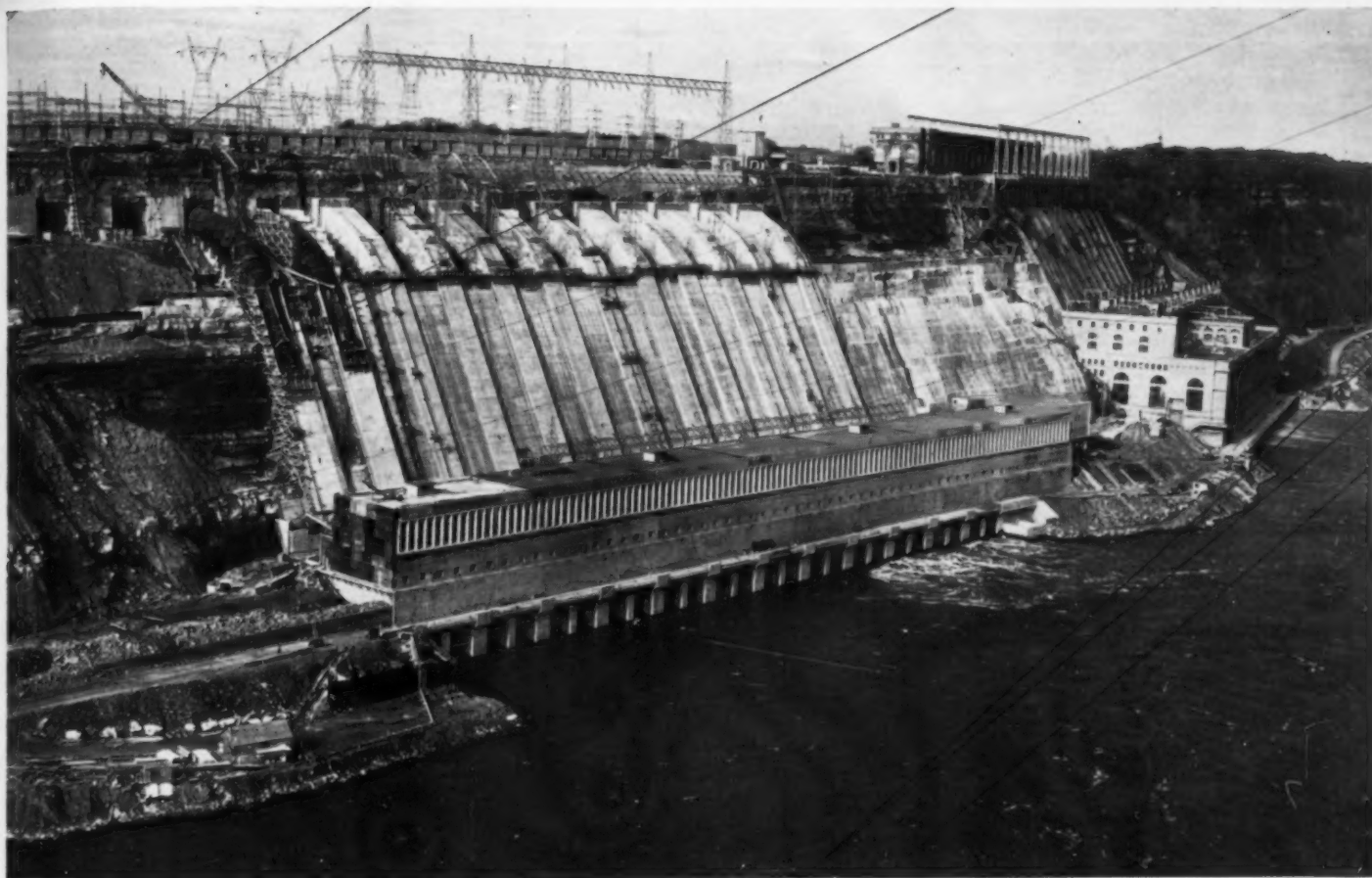
The changeover of a 12,000-square mile, 25-cycle area in Southern Ontario to the 60-cycle system prevailing throughout most of the continent had been considered for a long time. In addition to providing practically flickerless lighting, 60-cycle power makes a wider range of electrical equipment usable. And, even more important—since it involves the overall economy of this part of Canada and would be most essential in a time of disaster or power shortages—the frequency standardization program contributes to the effectiveness of a gigantic integrated power grid, a pool system linking facilities of power producers in New York State, Michigan and the Province of Quebec with those in Ontario.

Faced with the necessity of securing additional power to meet the spectacular economic growth of the province, the Commission sought and obtained a revision of the old Boundary Water Treaty of 1909-10 between Great Britain and the United States. The revision permitted additional diversion of water around Niagara Falls while providing against any impairment of the Falls as a scenic spectacle. This made it possible to start construction of the Sir Adam Beck-Niagara Generating Station No. 2.

This development, the largest single power project ever undertaken in Canada by a public utility, required the construction of twin $5\frac{1}{2}$ -mile tunnels diving deep under the city of



The Richard L. Hearn Generating Station at Toronto is the largest steam plant in Canada with an installed capacity of 536,000 horsepower. Its eastern waterfront location makes for efficient operation, for coal is brought by lake steamer and the cool water of the lake is used for condensing.



Sir Adam Beck-Niagara Generating Station Number Two is the Hydro's largest undertaking to date.

Niagara Falls to convey the water from an intake two miles above the Falls, to a $2\frac{1}{4}$ -mile open-cut canal leading to the powerhouse. To give some idea of the immensity of the job, construction of the tunnels alone required the excavation and removal of 4,000,000 cubic yards of rock. Water is now flowing through both tunnels, each of which has a carrying capacity of 20,000 cubic feet of water a second, a flow equal to about one-tenth of the total flow of the Niagara River.

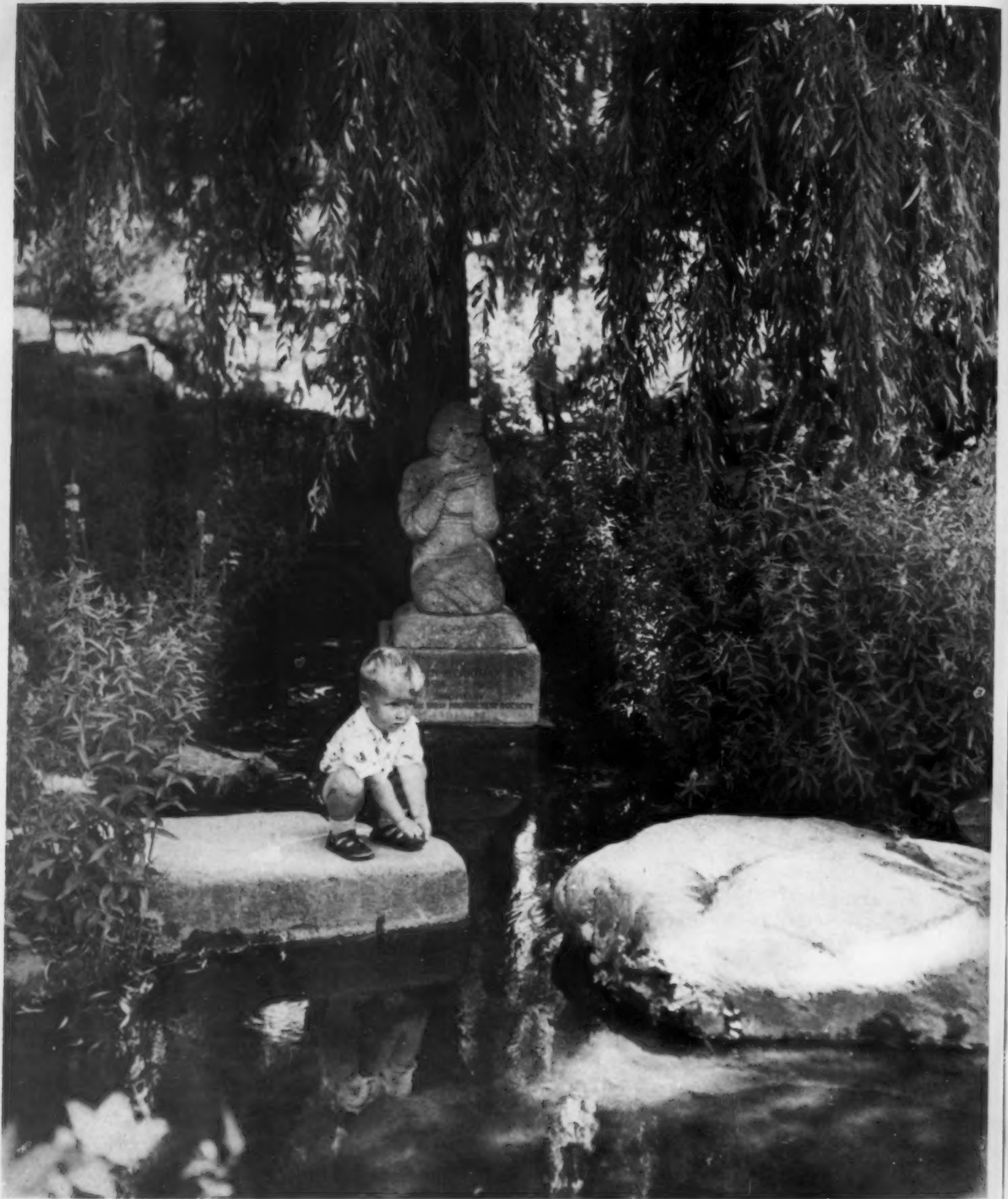
At the same time, the Commission turned with renewed vigour to the task of getting authority to go ahead with the St. Lawrence power project, a matter of concern to Hydro for more than forty years during which it had been a subject of fruitless debate in the United States Congress. From Ontario's point of view, the energy represented by the unbridled fury of the International Rapids Section was a waste—a waste which could be transformed into a source of electric power to keep pace with the demands of its ever-expanding economy.

On 7 June 1954, the United States Supreme Court decision upheld the right of the Power

Authority of the State of New York to participate with Ontario Hydro in the joint development of the power resources of the St. Lawrence. Just two months later, the project was officially begun in joint sod-turning ceremonies by the two agencies.

The preliminaries over, engineers and workmen moved in, armed with the knowledge gained from long years of study of the river and the surrounding terrain. Preparations for the job ahead included the building of three hydraulic scale models of the 35-mile long International Rapids stretch of the river—an example of engineering foresight that will result in the saving of millions of dollars.

So the battle was joined with the mighty river. There are three permanent dams to be built—Iroquois, Long Sault, and a giant integrated dam and powerhouse structure astride the International Boundary—along with miles of dikes. The ultimate installed capacity of the St. Lawrence Power Project will be 2,200,000 horsepower, half of which will be progressively available to the people of Ontario, with the first power scheduled for delivery in the summer of 1958.



A young visitor studies the goldfish in the willow-shaded rock garden pool. Behind him is the memorial to Owen Merriman.

Hamilton's Royal Botanical Gardens

by WILLIAM COCKMAN

Photographs by the author

NO OTHER CITY in Canada can welcome its visitors with such a joyous floral panorama as can Hamilton. Its Botanical Gardens extend over eighteen hundred acres of marshland, woodland, escarpment, and ravine, offering a unique example of talent and enterprise in the horticultural world. Prior to 1930 this area had nothing better to show than neglected fields, a gravel pit and refuse dumps. Since then it has brilliantly responded to the technical care wisely lavished on it by a farsighted municipality.

It was in 1919 that a naturalist, the late Robert Owen Merriman, who resented the local wildlife slaughter, helped to organize the Hamilton Bird Protective Society. This was followed eight years later by a bird sanctuary. In 1927 the Ontario Legislature passed an Act establishing the marsh and sanctuary as a Crown Game Preserve. A memorial to Owen Merriman stands by a willow tree in the rock garden. In 1930, the late King George V approved the use of the term "Royal" in connection with the botanical garden envisioned by Hamilton's Board of Park Management. The Board was then under the direction of the late Honourable T. B. McQueston, K.C.; today the Gardens are regarded as a memorial to him.

The Parks Board set aside a large block of land as the "Botanical Garden Section" and proceeded to carry out the program of 1930 with the aid of public-spirited citizens. The Royal Botanical Gardens were established by an Act of Legislature in 1941 and the new Board, under Dr. McQueston's leadership was vested with broad powers, as the following extract from the Act of Incorporation indicates:—

The Board shall have the power to and may establish and maintain upon its properties, parks, museums, zoological and other gardens, natural history collections, observatories, art galleries . . . and do all acts and things usually incident to the purposes of botanical gardens . . . receive, acquire and hold such lands . . . as it may consider advisable

Commercial fishermen take carp from Cootes Paradise but return game fish to the water.

in the development of the Royal Botanical Gardens . . . give courses of instruction in forestry, nature study, botany, horticulture . . . publish same . . . co-operate with any educational institution or public body for any of the purposes of the Board . . .

These ambitions have been realized in large measure except for a zoological garden. An art gallery now stands on the edge of the Forsythe Avenue plantings on land donated by the Royal Botanical Gardens. The handsome new Hamilton gallery is next to the sunken gardens at McMaster University's entrance. Another garden will be made, nearby in front of the new Teachers' Training College.

Education, research, and recreation are three fundamentals motivating year-round activities of the diligent Gardens' staff. Its members co-operate with McMaster University, assisting as lecturers and providing information on horticulture and conservation. In return, the university staff aids in the field of plant pathology,





Looking down over part of the rock garden.

return for their valuable aid. Mrs. Laking, also a horticulturist, shares in her husband's work.

The Spring Garden is the first to wave greetings to visitors approaching Hamilton along the Queen Elizabeth Way from the direction of Toronto. More than six hundred varieties of iris form a massed colour party of two thousand "flags", with the Niagara escarpment and an arm of Hamilton Bay for backdrop. This is succeeded by a peony display, followed by fine collections of daylilies (*hemerocallis*) and other lilies which carry this particular garden through to September.

The gay procession of gardens, nature trails, parkways and picnic grounds has been in existence since 1946 when a staff was appointed to take over the works begun by the Board of Park Management of Hamilton. The total program is supported by members and others in gratitude for pleasant hours spent in the gardens and woodlands. The Hamilton Junior League contributed towards the Children's House, and the Westdale Kiwanis Club has given barbecue pits and picnic tables at Princess Point, a spot reserved for picnicking, hiking, fishing, and winter sports.

while biology students with senior and graduate student assistants, conduct investigations in Cootes Paradise — the marsh that is their great outdoor laboratory. Their research studies range from virus incidence in wild plants, soil microflora and black fly fauna of streams entering the marsh and Hamilton Bay — to population fluctuations of field mice. The Research Council of Ontario supports these as it has earlier studies.

The Director of the Royal Botanical Gardens is Leslie Laking, B.S.A., graduate of the Royal Botanic Gardens, Kew, England. He has a regular staff of five, and a summer labour force of twenty-seven men. He participates in individual projects, and directs the children's gardens for sixty children between the ages of nine and fifteen; the Members Association gives volunteer assistance, and two of these volunteers have been awarded life membership in

About 100,000 people visit the gardens each summer.





Man and nature have combined to make a once-ugly gravel pit into a beautiful and renowned rock garden.

Inviting paths lead to the marsh waters, which rival the Muskoka Lakes for natural beauty. Some of these paths are well marked nature trails, guiding the wanderer into forest arbours, through white pine, white and red oak, birches, elms, and maples.

In Hendrie Valley, old coach trails have been cleared. Brood-Mare's Walk and Kicking Horse Pass, as part of the Garden's system of trails, will again yield pleasure to many. Along these the hiker sees trees from the Carolinas — flowering dogwood, sycamore, sassafrass and tulip trees. In September he dodges acorns dropping from oaken ceilings and sees squirrels and chipmunks stuffing their larders with butternuts, hickory nuts, and black walnuts.

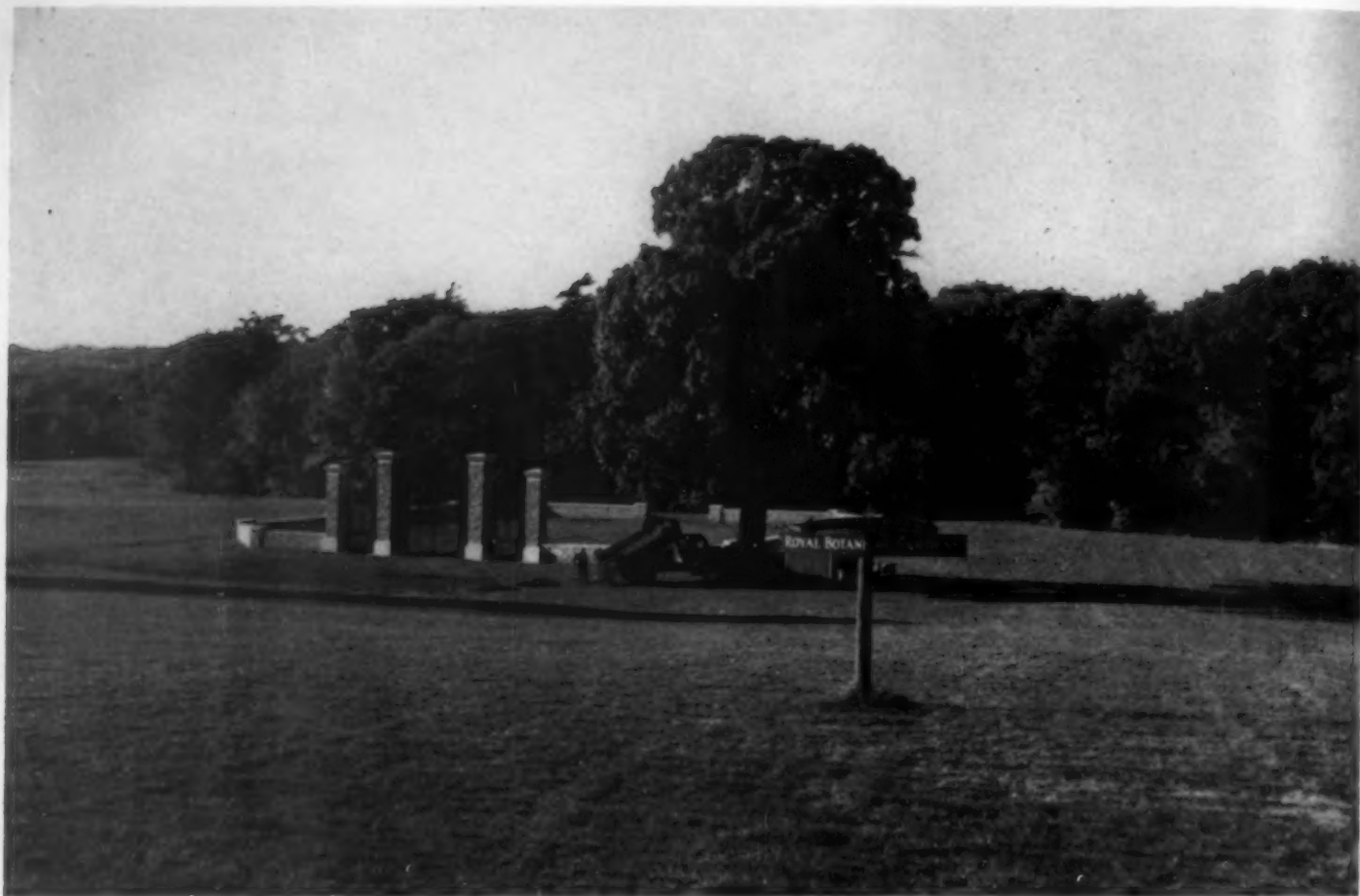
Animals of many species hide in the underbrush — among them deer, fox, raccoon, weasel, muskrat, and mink. If he is an experienced bird watcher, the hiker may in time identify 300 kinds of birds in the woods and marsh. Among them are the owl, bald eagle, hawk, grouse, pheasant, woodcock, sandpiper, kingfisher, woodpecker, kingbird, flycatcher, phoebe

jay, nuthatch, gull, nighthawk, crow, and a variety of swallows. Along the marsh shorelines he can stir up grebe, cormorant, bittern, heron, egret, sandpiper, geese, and myriads of ducks. At Easter he may see migrating swans drop down en route to their Arctic nesting grounds.

The visitor may fish — for sport rather than food, as the fish are not always edible. As a preliminary to reducing the population of coarse fish in the marsh, 23 kinds of fish were recorded, from brown trout to common carp. In 1954, 23,327 carp were removed as well as 3,607 catfish, 76 dogfish, 4,020 shad and six lamprey eels.

Game fish, too, were recorded but were returned to the waters of Cootes Paradise. Among them were 111 pike, 46 silver bass, 23 large mouth and 15 small mouth bass. Efforts at carp control will continue in an endeavour to improve the habitat for more desirable species of fish.

Five varieties of turtles make nuisances of themselves when the ducks grow careless or launch their young. With field glasses, the



Latest development is Hendrie Park, where walls will enclose a sunken garden overlooking the former farm.

A formal but friendly sunken garden graces the entrance to McMaster University.



HAMILTON'S ROYAL BOTANICAL GARDENS

visitor may count as many as 20 turtles sunning on a log in a secluded branch of the marsh waters.

While fishing is permitted, hunting or trapping is prohibited. A Federal Parks Act and a Royal Botanical Gardens bylaw allow prosecution of persons disturbing plants, shrubs, or wildflowers or performing other acts of vandalism.

Basking in this protection, Ontario's floral emblem—the white trillium—joins the trout lilies in springtime welcome to the visitor. Delicate white, pink, blue, and purple hepaticas adorn the silvan glens. There are hundreds of different wildflowers, from familiar buttercups to immigrants from the Carolinas such as the yellow violet, five-leafed gentian and carrion flowers with their blue-black umbrella-like clusters. Among the more interesting shrubs is New Jersey tea (*Ceanothus americanus*) which grows wild in the Gardens. History has it that New Jersey tea leaves were brewed over campfires during the American Revolution.

White and yellow water lilies serve as floating islands for the frogs and turtles. Fancy marsh marigolds and wild iris brighten the ponds and marsh, and the wild rice attracts hungry waterfowl.

In 1949 a conservationist was appointed to take charge of marsh and woodland maintenance, development, and protection. Today he is also responsible for reforestation, carp control, muskrat management, forestry practices, trail improvement, posting and patrol. There is also a project for the propagation of marsh plants important to wild fowl as food and shelter, which is chiefly financed by the Toronto Anglers' and Hunters' Association.

Last year, for the third time in succession, a Gladiolus Trial Garden was operated in conjunction with the Canadian Gladiolus Growers Council. Under trial were 83 seedlings originating in many centres across Canada. Standard records were kept and corms were returned to the supervisor of Canadian Trial Gardens. A Trial Garden for Canadian iris seedlings at the Spring Garden has been continued in co-operation with the Canadian Iris Society.

The Gardens are under the patronage of the Governor-General of Canada, the Lieutenant-

Governor of Ontario, and the Chief of the Botany and Plant Pathology Division of the Science Service at Ottawa. Dr. G. P. Gilmour, President and Vice Chancellor of McMaster University, is chairman and vice-president of the Board of the Gardens. The president of the Board is Hamilton's well-known judge, W. F. Schwenger. He has expressed warm appreciation of the increasing financial assistance from the Province of Ontario and regarded last year's report of the Gardens as the best to date.

The secretary of the Gardens is Raymond A. Sims, M.A., who among other duties, attends to public relations, photography, a library, and a thrice-daily weather report to assist Hamilton's Meteorological and Public Weather Office in forecasts.

The supervisor of the Gardens is James Redman N.D.H. who holds a diploma of landscape architecture from Reading University as well as the Kew and John Innes certificates. W. J. Lamoureux, B.A., who has a diploma from the Niagara Parks School for Gardeners and a certificate from the Royal Botanical Gardens, is the conservationist. The propagator is R. E. Hal-



Thousands of seedlings and bedding plants are tended in a modern lath house.



Youngsters find plenty to interest them on the nature trails through the woods.

ward, who also holds a diploma from the Niagara Parks School for Gardeners.

The staff considers living plant collections the most important asset of a young botanical garden. To augment these collections, both horticultural and botanical, is the prime ambition of the director and his staff. They are in

the process of labelling as many plants as possible to enrich the garden for its estimated 100,000 annual visitors. Labelling the thousands of plants, trees, and shrubs is a gigantic task. While collections of herbaceous plants are labelled up to date, it is said that competent assistance will soon be needed in the scientific labelling of trees and shrubs. Experiments are under way testing engraved metal labels for trees. Shrubbery labels engraved in black and white sandwich bakelite are also on trial. A Hamilton stamp and stencil company is contributing the various labels used along garden and woodland trails.

As they grow familiar with the names of plants and trees, visitors become interested in introducing more variety into their own gardens and enquiries about sources of supply are increasing. Unusual trees, both new and older aristocrats never before known here, will be featured as the arboretum develops.

Within the past four years, many visitors have expressed admiration of *Berberis verruculosa*, loveliest of the smaller evergreen barberries, growing in the Children's Garden. They also have praised the firethorns, *Pyracantha coccinea*, the Gardens' most exciting fall and winter fruiting broad-leaved evergreens. These and varieties of *Caryopteris* have commanded attention both in the Rock Garden and Children's Garden. Interest has increased, too, in the redbud, *Cercis canadensis*, as a result of a single specimen's performance in the Gardens.

In 1954, valuable additions were made through purchase, exchange, and gifts, especially in the woody plant collections. More than 800 different kinds representing some 3,470 individual trees, shrubs and woody climbers were brought in, some as small plants to be grown and others as specimens ready for the proposed Arboretum. Among the more interesting newcomers were 55 species and varieties of flowering crabs, 50 different kinds of broad-leaved evergreens such as *Buxus* (box), *Ilex* (holly), *Berberis* (barberry), and *Pyracantha* (firethorn); 34 varieties of rhododendrons and azaleas for an experimental planting in the Memorial Garden and 20 additional varieties of the famous Gable azaleas for trial.

The Gardens at Hamilton take advantage of



Family fishing parties enjoy sport on the marsh.



Marsh waters are swimming-fresh only in early summer; then there is boating till freeze-up and skating time.

the Index Seminum published by the Dominion Arboretum and Botanic Garden at Ottawa to list seed for exchange. Seeds collected in 1954 and listed for such exchange numbered 52 kinds, representing species and varieties of woody plants for which seed is not available at

the Dominion Arboretum. Some 377 kinds, chiefly woody plants, were received through exchange and surplus from Ottawa in 1954.

Some idea of the extent of the plantings may be gained by a survey of two members of the floral family here. Throughout the Gardens there are 683 iris and 644 hemerocallis (day-lily) varieties. In 1954 more than 28,000 individual plants arrived from outside sources. Many valuable ones were presented by enthusiastic people in Canada and the United States. A gift of 94 hemerocallis came from a person in Omaha, Nebraska.

Blueprints for the future — already off the drawing board and into production — feature a formal garden in Hendrie Park which will be the entrance to an Autumn Garden overlooking the 122-acre "Valley Farm" bequeathed to the Gardens by the late G. M. Hendrie. Equally spectacular will be the Arboretum on the northeast shore of Cootes Paradise. An entrance road and grand circle for parking will be com-



The Director talks to a summer class of boys and girls under the trees.



The Conservationist holds a pair of mallards.

pleted in 1955, bringing the first 70 acres ready for planting within reach of the public.

New nature trails will traverse the 300 acres of meadowland and deep wooded ravines overlooking the marsh from the north. The Arboretum will contain artistic displays of woody plants, a hedge garden, and a garden of climbers blending into a backdrop of native woodland. Near the winding road that leads to the Arboretum is a fragrant lilac garden.

In the next five years there is to be still further physical development of the Gardens

and Arboretum. Also on the horizon — literally and figuratively — is a permanent headquarters. It will be situated on a triangle of land atop a curve on the highway approaching Hamilton from Toronto. Facing the new Hendrie Memorial Park, it will function as the Botanical Garden Centre. It will contain facilities for administration, education, and research and will have rooms suitable for modern museum exhibits and for horticultural shows "of the quality known in Britain or Boston".

The present temporary headquarters building is a former summer hotel which the staff has converted into offices. A fire could destroy in an hour the years of labour and research represented in the herbarium, library, maps, plans and records. The new building will protect these for posterity.

The Mayor and the Hamilton Chambers of Commerce — senior and junior — are keenly interested in the great value of the Gardens to the city, as both a beauty spot and a tourist attraction. But their value is greater than that, for the Gardens serve not only the community but also the province and the entire nation.

As an independent organization, the Gardens receive revenue for maintenance from the City of Hamilton, some funds from association members and other sources. Capital grants from the Province of Ontario also assist substantially. With all of this support and encouragement the directors appear justified in their hope that eventually the Royal Botanical Gardens of Hamilton will occupy a position of importance among the better botanical gardens and arboreturns of North America.

The Director with a workshop class of children.



A volunteer member giving advice on spring planting.



EDITOR'S NOTE-BOOK

R. Gordon Robertson (*Aklavik—A Problem and Its Solution*) is Deputy Minister of Northern Affairs and National Resources, and Commissioner of the Northwest Territories. One of the Directors of the Canadian Geographical Society, Mr. Robertson first presented the Aklavik story as a lecture at the Annual Meeting of the Society in February. He was educated at University of Saskatchewan, Oxford University and University of Toronto. He entered the service of the federal government in 1941 and received his present appointment in 1953.

* * *

Charles Gallenkamp (*A River and Its People—Pueblo Indians of New Mexico*), whose home is in Houston, Texas, has been engaged in archaeological research in the southwestern United States and Mexico for the past seven years. With camera and pen he has recorded much of the passing cultural heritage of the Indian tribes living in these areas. It is his ambition to remove some of the misunderstanding and prejudice surrounding the American Indian.

* * *

Dr. Richard L. Hearn (*Ontario Hydro—A Pattern for Progress*) is Chairman of the Hydro-Electric Power Commission of Ontario and a director of Atomic Energy of Canada Limited. A native of Toronto, he graduated from the University of Toronto as a Bachelor of Applied Science in 1913, then obtained employment with the Hydro. By 1918 he had become Assistant Engineer on Construction, a position which he held until 1921, when he left the Hydro. For the next twenty-one years he served in various engineering and executive capacities with companies in the United States and Canada. In 1942 he rejoined the Hydro as Executive Assistant to the Chairman and rose in 1945 to the position of Chief Engineer of Design and Construction and in 1947 to that of General Manager and Chief Engineer. In January of this year he succeeded the late Robert Saunders as Chairman. Dr. Hearn's abilities

have been given public recognition on many occasions. In 1952 the University of Toronto conferred on him the honorary degree of Doctor of Engineering and last month he was presented with the Julian C. Smith medal, one of the most coveted Canadian engineering honours.

* * *

W. V. Cockman (*Royal Botanical Gardens, Hamilton*) lives in Hamilton and is an enthusiastic supporter of the Gardens. Photographing them and writing about them gives him a great deal of pleasure.

AMONGST THE NEW BOOKS

The Nor' Westers
by Marjorie Wilkins Campbell
(Macmillan, Toronto, \$2.00)

This, Marjorie Campbell's latest book, is a worthy addition to the Macmillan series, "Great Stories of Canada". The story of the Nor' Westers has, to a large extent, been submerged beneath that of the Hudson's Bay Company and it is a pleasure to read so clear and sympathetic an account of those who insist they were "drowned" rather than amalgamated in 1821. There were many great names among the Nor'Westers; we have but to mention Mackenzie, Fraser, and Thompson to realize the calibre of the men who built that once extensive fur empire.

Though written ostensibly for younger readers, no adult has any reason to shy away, and many people will find facts new to them. It is evident that a great deal of careful research has gone into the writing and the author has the rare gift of being able to visualize clearly the scenes encountered in her reading, to comprehend the inner significance of the dry and formal reports, and to appreciate the real value of her materials in terms of their power to make her readers see, not only the bare incidents, but the very thoughts and characters of the actors in those scenes of a hundred and more years ago. Chapter Twelve, especially, "We are Drowned Men . . .", is a moving and competent piece of writing.

The two tone illustrations by Illingworth Kerr are excellent. It is a pity the end-leaf map does not always bear out the text in the body of the book. DOUGLAS LEECHMAN

(Continued on page XIII)

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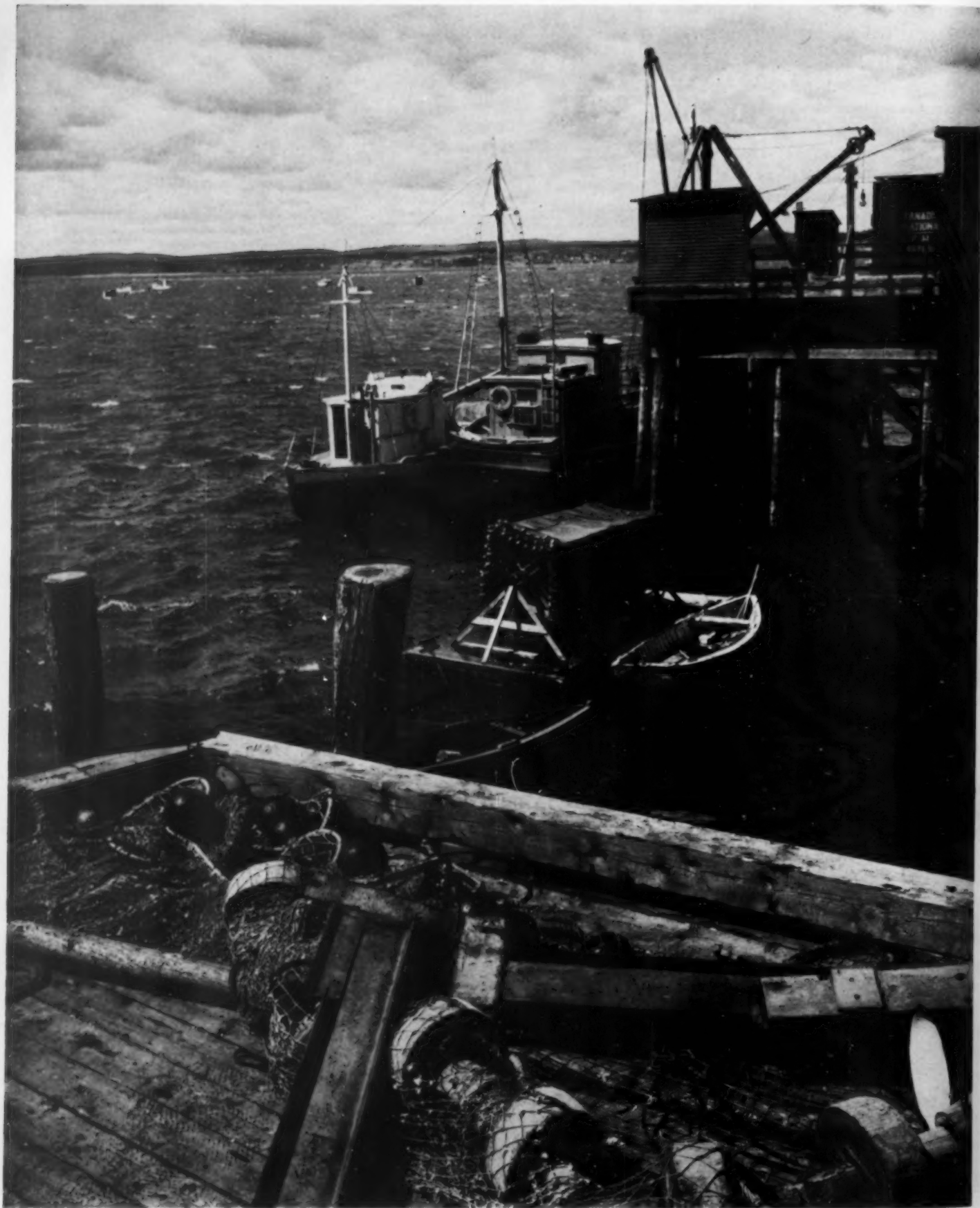
Requirements. A degree plus a year of teacher training.

Salaries, for teachers with Secondary Basic certificates range according to school districts from \$2800 to \$3200 for beginning teachers, and up to maximum salaries of \$5500 to \$6000.

Teachers interested should write immediately for information, submitting academic transcripts of degrees and official statements of teacher training to the Registrar,

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of
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Pictures of the Provinces—VII

For those who cannot resist the lure of small boats and deep-sea fishing, St. Andrews in New Brunswick has much to offer. Tuna fishing offers opportunities not yet developed to any great extent but other types of sport fishing are well established. St. Andrews, on the Bay of Fundy, near the border of Maine, is one of the province's leading summer colonies.

New Brunswick Travel Bureau



Sails in the sunlight cast their shimmering reflection on the still waters that run deep between the massive promontories of British Columbia's coastline. This is Princess Louisa Inlet, 140 miles from Vancouver, a tiny inland sea surrounded by mountains rising a sheer 6,000 feet from the water's edge. It is typical of the placid fiords along the sheltered Inside Passage where cool forests, cascading falls, aspiring peaks, and coast resorts are a standing invitation to the salt-water sightseer.

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THE TRAVEL CORNER



The S.S. Homeric, new flagship of Home Lines, is seen above (foreground) in her berth at Wolfe's Cove, Quebec City, before making her maiden voyage in the Canadian service to Europe.

Home Lines

New Flagship for Home Lines

Home Lines have put their new flagship, the S.S. *Homeric*, into service between Canada and Europe. The 26,000-ton vessel made her maiden voyage from Quebec to Southampton and Le Havre late in April. Altogether she is scheduled to make twenty-seven Atlantic crossings this year.

The *Homeric* was purchased by Home Lines late in 1953. Last winter she was sent to a shipyard at Alameda, California, to undergo the first part of the face-lifting that has made her practically a new ship. New boilers, turbines and other mechanical equipment were installed, also an air-conditioning system. Then the ship was sent to Monfalcone, Italy, where a complete transformation of the original cabins and public rooms took place. Skilful European decorators and artists added the finishing touches. By the time the job was finished, it had cost several million dollars.

Now the *Homeric* is a cruise-type vessel, as comfortable as you please, and well able to hold her own in competition with others sailing between Canadian and European ports. She has both first and tourist class

accommodation and can carry 1,165 passengers. There are three dining rooms, several spacious public rooms, two children's playrooms, a gymnasium, beauty salons, barber shops, gift shops, a cinema and a swimming pool (which may be used by tourist passengers as well as those in first).

The *Homeric* travels at a speed of about 20 knots and takes six days to complete her voyage. At both Southampton and Le Havre connections are easily made with boat-trains, so after landing passengers waste little time in reaching London or Paris. Information about sailing dates and rates may be obtained from travel agents or Home Lines Steamship Agency of Canada Limited, 1225 Phillips Square, Montreal.

European Music Festivals

This year there are forty-four music festivals in Europe. They started last month and will run on till October. Then the opera season begins, so travellers who enjoy music will find it wherever they go in Europe — and some of the world's best, too.

From the Girvan Travel Service of Toronto, Canadian representatives of the European Association of Music

Festivals, we received three brochures which we would like to mention. The first, entitled "1955 Music Festival Tours in Europe", contains a calendar of festivals of music, drama and ballet and the itineraries of three tours amusingly named the Rondo, Scherzo and Minuet. The latter starts from Montreal 30 July, lasts till 10 September, costs \$934.50 (exclusive of B.O.A.C. air fare) and takes in festival performances at Bayreuth, Salzburg, Munich, Verona, Rome, Lucerne, Edinburgh and Stratford-on-Avon.

The second brochure contains details about the first of these festivals — the one at Bayreuth in honour of Richard Wagner, dates for performances of "The Ring of the Nibelung" cycle, "The Flying Dutchman", "Parsifal" and "Tannhauser", and a list of those taking part in them. The third leaflet is the preliminary program for the International Festival of Music at Lucerne from 6 to 30 August. Instrumental and vocal soloists of world renown will participate in this one and the orchestra will be directed by a series of famous conductors. There will be chamber music and organ recitals as well as symphony concerts and also a play, "Mariana Pineda". Unfortunately we do not have space enough to write any more about these delightful continental tours and festivals, but no doubt the Girvan Travel Service will be glad to tell you more about them. Their address is 44 King Street West, Toronto.

The subject of European festivals cannot be dismissed, however, without mentioning one of the greatest of them all, the Edinburgh Festival. It will be held this year from 21 August to 10 September. Some of the most accomplished artists of our day will take part in it and the program includes music, ballet, opera and drama. There will also be art exhibitions. The Edinburgh Film Festival will be held at the same time. It is expected that about 200 films from thirty or so countries will be shown. To whet the appetites of those interested in attending the Edinburgh Festival while abroad, here is a sample of the bill of fare:

Instrumental Music: Symphony Orchestras, Berlin Philharmonic Orchestra, BBC Symphony Orchestra, Philharmonic-Symphony Orchestra of New York, National Youth Orchestra of Wales, Scottish National Orchestra. Conductors — Paul Hindemith, Eugene Ormandy, Dimitri Mitropoulos, Sir Malcolm Sargent, Guido Cantelli, George Szell. Chamber music orchestras — Netherlands Chamber Orchestra, London Baroque Ensemble, the Griller and Hungarian

Quartets. Special piano trio — Solomon, Francescatti and Fournier, to play the Beethoven Triple Concerto and also to perform as individual soloists with orchestra.

Opera: Glyndebourne Opera Company, with an international cast, to present Verdi's "Falstaff" and "La Forza del Destino" and Rossini's "Barber of Seville".

Drama: "A Life in the Sun", a tragedy specially written by Thornton Wilder for the festival; "La Dame Aux Camélias" by Dumas fils; "Othello", performed by the Old Vic Company.

Ballet and dance: Royal Danish Ballet Company, to present six ballets including a new production of "Romeo and Juliet" with music by Prokofiev and choreography by Frederick Ashton; the Azuma Kabuki Dancers and Musicians of Japan.

Ontario Motor Tours

Holiday Motor Tours are offering package tours out from Toronto to various places in Ontario from now until early October. Guests are taken about in modern motor coaches and five or eight passenger cars. On request the company will arrange special tours for parties of four or more people. Their Pioneer Trail Tour, lasting five days, includes visits to Kingston's Royal Military

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Annual membership dues, which are \$4.00 per annum in all parts of the world, include subscription to *Canadian Geographical Journal*.

College and Old Fort Henry, a cruise among the Thousand Islands, sight-seeing in Ottawa and a cruise on the Rideau Canal, and a trip to Chalk River, returning through Muskoka to Toronto with a stop on its outskirts for dinner at the luxurious Guild Inn. If arrangements are made in advance, you may visit the Martyrs' Shrine at Midland and the Huronia Museum instead of touring Muskoka. Transportation, accommodation and some meals are included in the price of the tour, which is \$99.50 for one person. This is only a sample of what is offered. There are several other tours of varying lengths, most of them to popular Ontario vacation places. Details and brochures may be obtained from Holiday Motor Tours, 1204 Yonge Street, Toronto.

**Anniversary of the Expulsion
of the Acadians**

This summer many Acadian villages in the Maritime provinces will mark with appropriate ceremonies the 200th anniversary of the expulsion of their forefathers from Acadia. Between 15,000 and 20,000 descendants of early settlers are expected to take part in the celebrations, which officially commence in Moncton 10

August. At the stadium every evening for a week there will be an historical pageant with over 300 people in it. At Moncton High School there will be folk songs and dances, and a play, "Evangeline", based on Longfellow's poem, will be given at St. Joseph's University. There will also be concerts, parades, fireworks displays, and a number of religious ceremonies including two Pontifical High Masses.

Otter Lake Music Centre

If you would like a different kind of holiday this year, you might enjoy a stay at the Otter Lake Music Centre, which is about eighty miles northwest of Montreal at Huberdeau, Quebec. At the Centre study of music and recreation are mixed in proportions agreeable to amateur musicians. In the mornings musical experts conduct classes in choral singing, recorder playing, chamber music, sight singing, elementary theory and choral conducting. There are also classes in French and English conversation. The afternoons are left free for swimming, boating, mountain climbing, tennis or plain lazing, while evenings are given to singing, informal concerts and lectures by visiting speakers.

Students live in Otter Lake House beside the lake. The members of the teaching staff are Mario and Ellyn Duschenes, Walter Joachim and the founders of the Centre, George and Carl Little. No previous knowledge of any branch of music is required of students: a sincere love of it is enough to make you welcome. The Centre is open for two weeks, 15 to 28 August, and you may stay for one week or two. Fees include room, board and up to five courses; they range from \$58 to \$75 a week for those in residence, depending on whether a room is shared and the number sharing it. Music and recorders may be bought at the Centre. Anyone interested in going should make application at once as membership is limited. All correspondence should be addressed to The Secretary, Otter Lake Music Centre and Festivals, Incorporated, Post Office Box 195, Outremont, Montreal 8.

Advice from Hawaii

Everything, it seems, is grist for the publicity mill these days. Ordinarily one does not think of volcanic eruptions as occurrences which would be mentioned above a whisper by promoters of tourist travel. But in Hawaii such is not the case. In a recent issue of *Hawaii Travel News*, published by the Hawaii Visitors Bureau, we read that although travel agents could not promise visitors to Hawaii the eruption of a volcano, there was always a good chance that one might happen. "If it does", said the *News*, "the smart thing to do is act quickly in making reservations for plane flights to the lava front." Reading on, we learned that Kilauea, the latest Hawaiian volcano to erupt, had been nicknamed the "drive-in volcano" because so many thousands of people had rushed to watch it in action. Some, the story goes, even took along picnic lunches.

So much for what you might see in Hawaii. There are other things that may be counted upon, since they do not depend on nature's convulsions. In August, when the annual hula festival is held, dozens of dancers ranging from toddlers to grandmothers will perform in Honolulu's Kapiolani Park. On 24 September, 22 October and 19 November *hukilau* will be held at Laie Bay, an hour's drive from Honolulu. At these there will be displays of Hawaiian handicrafts, Samoan and Hawaiian dances will be performed, and guests will be served traditional *luau* luncheons. Aloha Week, with its interesting multi-racial program and colourful pageantry, will be celebrated 15-22 October.

Amongst the New Books

(Continued from page VII)

Climatological Atlas of Canada

by Morley K. Thomas

(Meteorological Division, Dept. of Transport; and Division of Building Research, National Research Council, Ottawa, \$2.00)

A convenient atlas depicting a wide variety of climatic data has been presented in a joint publication of the Department of Transport and the National Research Council. It is not our purpose here to attempt to cover the range of climatic data mapped in this atlas. The amount of work that has gone into its preparation is clearly shown by the results. Clear, concise maps with data presented in isopleth form give the broad picture of climatic phenomena as they occur across this country.

The atlas should have wide appeal as most of us are affected by climate from time to time—apart from the daily necessity of having to live with it. The type and style of house we build; the road conditions we may encounter when travelling; the vacation area we select; the crops we grow; and many other aspects of life are influenced to a certain extent by climate.

Basic climatic data are a necessity in many studies. There is, in addition, an equal need for an interpretation of climate as it affects man and his activities. Little of this has been attempted in this atlas apart from design temperatures. No mention was made of frost-free periods or of growing season.

The use of hythergraphs as devised by Professor Griffith Taylor as a means of comparing climate from place to place is an interesting feature. These graphs should provide a lot of interest to general readers as they see whether it is wetter, drier, hotter or colder where they live than elsewhere.

A map showing the location of climatic stations which have been used as a basis for plotting data would have been a welcome addition.

This atlas should fill one of the gaps that has existed in our knowledge of Canada. GORDON D. TAYLOR

A Gardener's Source Book

by G. H. Hamilton

(Dent, Toronto, \$4.50)

Although restricted in its applicability to the warmer parts of Canada, this book will be hailed with enthusiasm by many amateur gardeners, nor will the experts treat it with anything but a welcome. Many a happy reader will pore over it for hours, stimulated to the contemplation of great endeavours in his garden. The arrangement of the material so as to provide tasks for each week, with discussions of related and appropriate subjects, ensures that there need never be a wasted week-end or a lost hour of twilight.

The photographs are good, but the lack of colour is regrettable in a book about flowers. There is a full section on the control of pests, and an adequate index to guide the reader to the topics he seeks. It should make a first-rate present for a deserving gardener.

DOUGLAS LEECHMAN

* * *

Gold in the Grass

by Margaret Leatherbarrow

(Ryerson Press, Toronto, \$4.00)

This book has the absorbing theme of human triumph over very adverse conditions. Alfred Leatherbarrow was a war veteran with a forty percent disability from wounds. After his return to Canada from his war service, he bought a farm at Fergus, Ontario, which was in such poor condition that the authorities for the Veterans Land Act, refused even a loan. He himself had practically no experience in farming, and he married a town-bred wife. With everything set for disaster, he made such a triumph over his worn out, weed-ridden land that in the short space of eight years the farm became a show place for prosperity. The agents of the Veterans Land Act now came forward with their maximum loan, coupled with an assurance from the Minister for Veterans Affairs that the loan might prove to be the best investment they ever made. This astonishing transformation of poor land into a thriving farm was achieved by



patience, study, and careful experimentation. Mr. Leatherbarrow and his wife worked together as a perfect team through countless obstacles and hardships to their ultimate and well deserved success. It is a happy story, told with great simplicity by Mrs. Leatherbarrow whose courage and support contributed so much to the fulfilment of her husband's aims and ambitions.

S. SEELEY.

* * *

The Vanta Kutchin

by Douglas Leechman

(National Museum of Canada
Department of Northern Affairs and
National Resources. Bull. No. 130
1954. \$1.00.)

This recent Bulletin, with its attractive cover and end-papers in three colours, is a credit both to its author and to the Director of the National Museum of Canada, showing as it does that a scientific publication issued under the auspices of the Government need not be ponderous in style or dry-as-dust in contents.

Its fourteen sections cover many aspects of the daily life of a group of Loucheux Kutchin Indians living at Old Crow on the banks of the Porcu-

(Continued on next page)



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(Continued from previous page)

pine River in the northern Yukon. They are a Déné people whose ancestors migrated from Siberia into Arctic America at a comparatively recent date. Though they have now forgotten much of their past and live in many ways as we do—one of them would have grapefruit for breakfast—times of social crisis, such as a birth or a death, see the old traditions cropping up.

About the only remaining vestige of aboriginal clothing is the moccasin. The people all have the Mongolian spot at the lower part of the spine at birth and many of them show a well-marked Mongolian fold at the inner corner of the eye.

There are many interesting bits of folklore here that make good reading. Should you meet a bear in the bush, you might keep in mind the Indian theory that bears are near-sighted and have but a short memory. They readily catch sight of a moving object, but forget it as soon as it stops moving; therefore, stand stock still and the bear will not remember that he ever saw you in the first place.

Or, again, here is a simple method of catching hares or rabbits. If you have no weapons, tie an eagle feather to the end of a short stick and hurl it through the air. As it flies, the

feather flutters and buzzes so that the rabbit mistakes it for a swooping hawk or eagle and "freezes". As it sits there terrified, you may pick it up in your hands if you advance quietly.

The photographs, by the author, are enhanced by delightful sketches by Mr. Ingram of the Museum staff, an artist who is responsible also for the cover and the end-papers. The literary style is good and the whole Bulletin is a useful first-hand study of a little-known people and a distinct contribution to Canadian anthropology.

MARIUS BARBEAU

* * *

Ottawa

by Blodwen Davies

(McGraw-Hill, Toronto, \$3.95).

This account of the City of Ottawa differs from others in being up-to-date in describing many institutions as they are now, as well as giving some light on their origin and background. The result is a convincing portrait of Canada's capital city, informative and pleasant to read.

There is always a good deal of research hidden in the pages of such a book as this. When writing her *Ottawa*, Miss Davies may have found the research even more troublesome than usual, not because of any lack of raw material but rather because the various authorities disagree. When confronting such a situation, the author could only weigh the

evidence presented by each and then form her own conclusion. In most cases, we trust, this has worked well enough, but all too often it has not.

On page 8 we are told that "Philemon Wright was born in Woburn in 1760". Woburn, Massachusetts, that is. A. H. D. Ross, in his *Ottawa Past and Present* (page 12) speaks of "Philemon Wright, who, in 1760, was born in the County of Kent, England. Shortly afterwards his parents settled 'near Woburn, in the Province of Massachusetts, in New England'." Mr. Ross has no footnote to tell us where his quotation came from. Dr. Lucien Brault, in *Ottawa Old and New* (page 54) refers to "Philemon Wright, of Woburn, Massachusetts". Of the three authors, I repose most confidence in Ross.

Such a discrepancy is unfortunate, especially in view of Wright's importance in the history of Hull and Ottawa. Nor is this the only slip to be found. There are far too many others. On page 11 we are told that "split cedar boughs were laid alternately convex and concave to make roofs tight against the weather". Anybody familiar with the thin and twisted boughs of the local cedar will realize that some other material must be intended.

There appears to be some doubt as to the difference in elevation between the Rideau and the Ottawa Rivers. On page 41 we are told that MacTaggart's party of surveyors "found

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that the rise from the level of the Ottawa River to the Rideau River was forty-five feet". Then on page 82 we are assured that the same MacTaggart (now given as MacTaggart, though Ross has McTaggart) says in his *Three Years in Canada* "the height is eighty-three feet". The engineer now in charge of the Rideau Canal tells me the difference is actually seventy-nine feet on the average, varying with seasonal fluctuations in water levels.

There are some strange vagaries in spelling: dence for dense (page 42); ingenious for ingenious (page 43); Argyll for Argyll (page 150). Most amusing is the statement that, in the Peace Tower Carillon, "the hours are struck on the largest bell, called The Bourbon". Ten tons of bourbon would make quite a long drink. The carillonneur assures me it should be "the bourdon".

The account of the National Museum is lop-sided and inaccurate, devoting most attention to but one of its many activities, and the history of the National Gallery is woefully incomplete. Strange, too, is the statement that officers of the Hudson's Bay Company made observations of the earth's magnetism in the Arctic in 1668 (page 169). The Company was incorporated on the 2nd of May 1670.

Miss Davies purports to be writing a serious factual book. In so doing, she at least implies that we may accept her account of the City of Ottawa as being, as far as space allowed, complete and certainly as being accurate. Such slips as I have pointed out are but a few out of many and do much to weaken our confidence in the rest of the book.

DOUGLAS LEECHMAN

* * *

French Bibliographical Digest

Science: Geology

(Cultural Division, French Embassy, 972 Fifth Avenue, New York 21. Free on request.)

This is a very useful volume for those who wish to keep informed of the contributions to geology made by French scientists during the period 1948 to 1954. Its opening part, by Louis Glangeaud, Dean of the Faculty of Science at the University of Besancon, summarizes the activities and trends in French geology during this period. This is followed by lists of French periodicals dealing with geology and related sciences, French scientific societies, and official geological agencies responsible for research in geology. The main part of the volume consists of a well-classified

bibliography of important geological publications, books, monographs, articles, etc. with summaries in English of many of those listed. A directory of publishers and an index of authors and collective works conclude the publication.

F.J.A.

* * *

South Col

by Wilfrid Noyce

(British Book Service, Toronto, \$4.25)

A book by any member of a group as carefully chosen as the 1953 Mount Everest team would command a sure interest with the public, but when the author can add poetic and literary gifts to a mountaineering skill that enabled him to reach the South Col, his book is more than welcome. Much charm is added by the wide variety of the illustrations, particularly the photographs taken by the author himself and here published for the first time. The text is made easier to follow by the splendid views of the awesome route which the party took, and also by a number of forceful drawings made under the author's supervision. The official story of the great Everest achievement has been admirably handled by the leader of the expedition. This supplementary record tells us the more intimate and personal side of the great adventure. The author has in the highest degree the gift of making us feel and see the simple daily happenings of life as the party progressed on the toilsome way from camp to camp. Each member stands out for us, clear and usually smiling in spite of the constant strain of sustained effort at such altitudes. The climbers, both British and Sherpas, seem to be stepping right out of the pages of the book to meet the reader, so vivid is the pictorial effect of the writing. These men faced the challenge not only of the highest mountain in the world, but also the daily demands of some valve that leaks or gets ice-blocked, a spanner that is not there when urgently needed, or some trusted gadget that turns sulky at the touch of numbed fingers. The summit of Everest was by far the greatest, but by no means the only achievement of this magnificent adventure. The author, speaking from very wide mountaineering experience, tells us that this was the happiest party he had ever joined, a fact which he attributes largely to supreme skill in leadership; the severity and magnitude of the task is brought home to us through Mr. Noyce's eyes, yet he is able to add, "And always, through all the expedition, there was laughter."

SYLVIA SEELEY

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